THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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# COMPUTERWORLD

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**Senior MIS execs** get the Windows treatment from Bill Gates. Page 18.

# Tools give new life to aging VSE

*Software skirts lock-file problem, staves off costly upgrade to MVS*

BY CHARLES BABCOCK
CW STAFF

MIAMI — Terry Woodward, lead technical specialist at Storer Administration, Inc., realized a year ago that his IBM 4381 Model 3 was overtaxed and could not handle his six IBM VSE systems much longer.

At the time, capacity planning at the cable services company indicated that its processor would run out of steam in June and Woodward would face both a $2 million upgrade and a possible conversion to IBM's heavy-duty operating system, MVS.

But Woodward is still running multiple VSEs on his 4381 because of a new software product that better manages the lock-file contention that frequently plagues VSE, he said. "We feel we've delayed our processor upgrade for eight months, and we may not have to move to MVS at all," Woodward added. The $6,000 product that helped stave off both moves was Softkey from start-up firm Jeyco in Lincoln, Neb. Softkey is typical of a set of products that has emerged during the last year to extend the life of the still widely used VSE operating system.

Nearly half of today's 6,444 VSE systems are employed as multiple systems under IBM's VM with shared direct-access storage devices, according to market research firm Computer Intelligence. Going to multiple VSE systems under VM is viewed as an intermediate step between VSE and MVS, but many users — typically smaller,

*Continued on page 8*

# Users scoping out DEC net controls

BY ELISABETH HORWITT
CW STAFF

As IBM continues to step up its campaign to get Netview accepted as a de facto industry standard, Digital Equipment Corp. is quietly promoting its products' abilities to manage a multivendor network.

While DEC products have made it onto the lists of many companies shopping for network management systems, MIS managers have long criticized DEC's inability to provide the centralized control and monitoring features that are among the strengths of Netview.

For some customers, DEC network management products appeared to spring from nowhere during last month's Decworld '87 in Boston.

"At the 1986 Decworld, we saw one very simple [network] histogram, and when we asked about other products, we got a lot of foot shuffling," reported Jay Guenon, president of LAM Consulting, Inc., which is currently designing a network for the Maryland Institute for Emergency Medical Services Systems. "This year, all sorts of management software had come out — or else they were suddenly pushing the products they have," Guenon added.

DEC devoted a hefty amount of Decworld floor space to network management in order to "let the marketplace know we've had this stuff a long time," said Ray Grenier, DEC manager of network management product marketing and services.

Several DEC users expressed a strong interest in DEC's off-the-shelf software packages, which were designed

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**Plugging in**

*The majority of large VAX systems in the U.S. are linked in networks*

* Vaxclusters require Decnet

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART: AMY J. SWANSON

# Encryption standard to get reprieve

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Despite opposition in the intelligence community, the National Bureau of Standards plans to reaffirm its support for the widely used Data Encryption Standard for another five years, according to NBS sources.

That would be good news for MIS managers in the banking industry and in federal agencies, who say they increasingly depend on DES-based equipment to protect electronic funds transfers, data communications and sensitive computer data from unauthorized access.

"The progress of information security in the private sector would be seriously impeded by the loss of the Data Encryption Standard," said Joan M. Reynolds, vice-president of corporate data security at Chemical Bank in New York. "Banks will hesitate to protect themselves with a technique that the government does not consider prudent," she wrote in comments to the NBS.

**Support eroded**

Federal support for DES has been in question for more than a year because the National Security Agency, a U.S. intelligence organization, has shifted its support away from DES in favor of new, secret encryption algorithms embedded in silicon [CW, May 19, 1986].

The DES became a standard

*Continued on page 134*

# It's Basic: Language to joust with macros in OS/2's arena

BY DOUGLAS BARNEY
CW STAFF

REDMOND, Wash. — Basic will not only serve as the batch language for Microsoft Corp.'s OS/2 and Presentation Manager but will also evolve into a general-purpose macro language that will compete against others such as that in Lotus Development Corp.'s 1-2-3, according to Microsoft officials.

The firm used the kickoff of Quickbasic 4.0, a language product, to explain its far-reaching Basic strategy intended to extend the popular language's life into the next generation of MS OS/2 and the Presentation Manager.

While Quickbasic offers many features never before found in Basic, a further-refined product will serve as the batch language for MS OS/2 and the Presentation Manager. "The [existing] batch language is running out of steam and does not know about Presentation Manager stuff," said Steve Ballmer, vice-president of systems software at Microsoft. Quickbasic is not yet available as a development environment for MS OS/2, but a Basic compiler will eventually be available for that operating system, officials said.

Over time, Microsoft intends to position Basic as a general-purpose macro language. If the firm succeeds, users will be able to use one language to create routines that work with a variety

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NEWSPAPER

SECOND CLASS

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**Sun shines.** Sun last week reported sales growth in its first fiscal quarter and introduced a CASE environment that networks multiple developers. Today, the company is expected to agree to license its 32-bit RISC architecture to AT&T. Pages 4, 8, 10.

**Storm ahead?** ETA adds air-cooled ETA10 processors, which it says fill the gap between near-supercomputers and supercomputers and might threaten Cray, DEC and Convex systems. Page 6.


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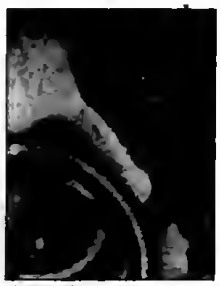

*Correlating performance and capacity. Pullout section.*


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*"If you go out and sell too soon, you create expectations that you may not have the manpower and infrastructure to deliver; you could have sharpshooters working against you."*

ELAINE BOND
CHASE MANHATTAN BANK

*See story page 95.*


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# Microsoft Intermail buy starts work group push

BY STEPHEN JONES
CW STAFF

REDMOND, Wash. — Attempting to stake a claim in the emerging desktop communications market, Microsoft Corp. last week acquired Intermail, an electronic mail program for Apple Computer, Inc.'s Macintosh.

Microsoft will reportedly begin marketing the product as Microsoft Mail in December at an as yet undisclosed price. Developed by Interactive Network Technologies, Inc., Intermail currently ranges in price from $299.95 for work groups of one to four users to $949.95 for groups of 21 or more.

The software allows users to send and receive messages, graphics and entire files electronically over Apple's Appletalk network. It also features background server operation, multiple zone support and network management facilities. Microsoft said it will encourage third-party software developers to use Intermail's open architecture as a foundation for future connectivity products.

**Enhanced version to come**

Microsoft will also design versions that support Ethernet and personal computer-based systems in 1988, according to John Morey, product manager for Microsoft's integrated office systems group.

An enhanced version of the product, which is expected to feature connectivity between Mac networks over Appletalk and customized directory listings for users, will be released next year, Morey said.

Microsoft said it sees Intermail as an entry into developing what it called integrated office systems. Morey said such systems will feature Microsoft Mail running with Microsoft applications like Word on desktops with Intel Corp. 80386-based servers. The connectivity features of Microsoft Mail, he claimed, will help Macintoshes and PCs talk to one another.

Underlining its seriousness about development of the E-mail package, Microsoft has named Bob Matthews, a key developer of the company's Windows, to spearhead the design team.

**No big deal**

Some analysts, however, downplayed the importance of the Intermail announcement. "There aren't enough Macs on networks today to make the acquisition that big of a deal right now," said Bruce Johnston, an analyst with First Boston Corp. in New York.

"The fastest growing element of the electronic mail market is in local-area network-based microcomputers, so Microsoft is doing the right thing," said Krystyna Filistowicz, an analyst with Dataquest, Inc.

As part of the acquisition, Microsoft signed Intermail developer Nick Holt to a one-year, renewable consulting contract. Steve Ullman, who helped design Intermail, reportedly will provide consulting services on a six-month, renewable basis.

The Intermail package already competes with Inbox, an electronic mail program from Think Technologies, Inc., which was recently acquired by Cupertino, Calif.-based Symantec Corp. Analysts said competition will heat up as Microsoft puts its financial muscle behind the development and marketing of new Microsoft Mail products.

That does not seem to bother Symantec, though. "Microsoft can't possibly be all the solutions to all the people," said Spencer Leyton, vice-president of business development for Symantec.

# DEC raises server capacity

BY ELISABETH HORWITT
CW STAFF

MERRIMACK, N.H. — Digital Equipment Corp. last week targeted large, multivendor installations with Decserver 500, an Ethernet server that is said to support up to 128 asynchronous devices. The previous Decserver 200 model can only support up to eight connections.

The server is said to connect terminals, personal computers and printers to an Ethernet network using Decnet protocols. Workstations can also use the server to communicate and access peripherals locally, without going over the main Ethernet network, DEC spokesman Mark Lederhos said. This allows corporations to provide networking to a large user population without overburdening the main Ethernet backbone, he pointed out.

While different Decserver 200 models must be used to support either DEC-423 or RS-232 devices, the Decserver 500 can support interface cards for both types of connection, according to DEC. Priced at $15,250 and available immediately, the Decserver 500 provides increasing per-port cost savings over the 200 model as the number of devices increases.

# KnowledgeWare announces two new *CASE* tools

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# IBM profits turn up at last

*Firm posts 12% increase after slogging through six declining quarters*

BY CLINTON WILDER
CW STAFF

IBM showed signs last week of its long-awaited business turnaround, halting six straight quarters of earnings declines with a 12% year-to-year profit increase. But that third-quarter performance still lagged well behind Digital Equipment Corp.'s 48% profit leap and Amdahl Corp.'s fivefold earnings increase.

IBM's earnings of $1.21 billion showed the best percentage increase since the fourth quarter of 1985, when the firm benefited from a massive year-end ramp-up of its 3090 mainframes. But IBM's pretax operating income of $1.56 billion in the quarter ended Sept. 30 was virtually the same as year-earlier levels, dampening enthusiasm for the results.

"IBM is not out of the woods, by any stretch," said Stephen Smith of Paine Webber, Inc. "There are still major problems to be addressed. But order momentum seems to be building."

Drexel Burnham Lambert, Inc.'s Peter Labe said the growth of new orders exceeded 10% for the first time in two years.

### Big fourth quarter seen

Most analysts said they were optimistic that IBM will report a strong fourth quarter, based on expected shipments of the company's 9370 processors, 3090E series mainframes, new 3380 disk drives and high-end models of the Personal System/2.

"Everything points to a big fourth quarter, and IBM has been telling analysts to maintain their full-year forecasts," Labe said.

"It is typical for CPU vendors to do 40% of their earnings in the fourth quarter, when users are spending all of their budgets out of fear that they won't get the same budget next year," he explained.

In the fourth quarter, "the 9370 will begin to kick in, at least within IBM's current customer base," Smith said. "It's not the [DEC] VAX killer that everyone was talking about, but 4,000 units in the quarter would be $1 billion in revenue, so it's still a significant factor."

In the third quarter, IBM's bottom line benefited by one-time gains from favorable foreign currency translations, the sale of Intel Corp. stock, tax provisions that were 2% lower than 1986 levels and the comparison with a dismal year-earlier quarter when profits plunged 27%.

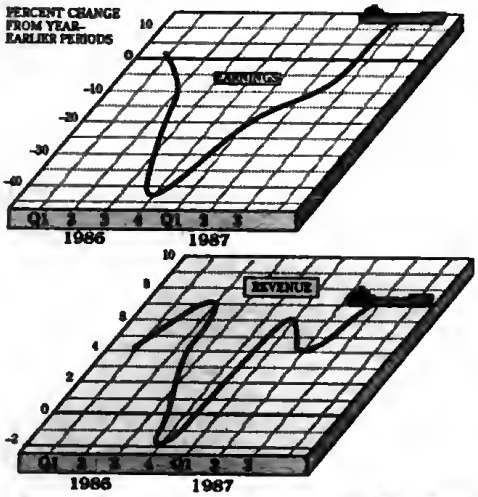
Despite IBM's much-publicized expense controls, the rate of its cost increases still outpaced its revenue growth, 8% to 7%.

"The transition has started, but the rate of change is quite slow," said Michael Geran of E. F. Hutton & Co. "They're still feeling pricing pressure on their older products and seeing only a gradual ramp-up of new products."

Revenue for the quarter rose to $12.73 billion from $11.91 billion a year ago. Per-share earnings reached $2, up from $1.76 in the third quarter of 1986.

**Turning the ship around**

*IBM's quarterly earnings picture improves for the first time in 18 months*




CW CHART: AMY J. SWANSON

One unusual factor in the results was a 1% decline in IBM's maintenance revenue. The drop reflected IBM's Corporate Service Amendment price cuts that took effect June 1, although the growth rate of service revenue slowed considerably in the first two quarters. The increasingly competitive segment has grown just 5% for the first nine months of the year, compared with 21% in 1986 and 16% in 1985.

"Both IBM and DEC have realized that maintenance is one of their best competitive weapons," Smith said.

Maynard, Mass.-based DEC reported first-quarter revenue of $2.53 billion, a 24% increase from $2.04 billion a year earlier. Profits increased to $269.9 billion, or $2.03 per share, up from $182.6 million, or $1.37 per share.

### DEC a 'steady earner'

The results were in line with most analysts' expectations, which in itself was unusual.

"For a long time, DEC would always surprise us on the downside, then they had six quarters in a row exceeding expectations," said Susie Peterson of First Boston Corp. "Now, people will have to get used to DEC just being a steady earner."

DEC increased its spending significantly in several areas during the quarter, including the addition of 3,600 employees for a worldwide total of 114,000. Noting DEC's no-layoff policy, Peterson said the increased work force "could be worrisome" for DEC's bottom line if the company's sales begin to stall.

### Amdahl reaches for stars

Meanwhile, Amdahl Corp. continued its stellar year with an outstanding third quarter, reporting a more than fivefold surge in profits on sales that grew 65%.

Revenue rose to $362.7 million from $220 million a year earlier. Net income was $36.8 million, or 69 cents per share, compared with $7.1 million, or 15 cents per share.

For the year's first nine months, the Sunnyvale, Calif., plug-compatible mainframe maker's profit was $93 million, compared with $12.2 million in the same period in 1986.

Although Drexel Burnham's Labe predicted that Amdahl's growth rate will slow in 1988, he said he expects revenue increases of 20% to 25%.

"IBM will have a major announcement in February, but we think Amdahl has an answer," he said.

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# Apple, Sun hit MIS hard, score quarterly profit victories

BY CLINTON WILDER
CW STAFF

Apple Computer, Inc. and Sun Microsystems, Inc., two of the year's most notable vendors for penetrating the corporate MIS market, both reported strong financial gains in the quarter ended Sept. 30.

Cupertino, Calif.-based Apple surpassed analysts' predictions by more than doubling its fourth-quarter profits on sales that surged 54%.

Sun, the technical workstation vendor in Mountain View, Calif., continued what has become its standard growth as sales and net income both approximately doubled in its first fiscal quarter.

Apple reported profits of $71.7 million, or 54 cents per share, up from $32.9 million, or 25 cents per share, a year ago. Sales reached $786.4 million, compared with last year's $510.8 million.

Apple has been increasing personal computer market share in both its Macintosh and Apple II product lines, according to Hambrecht & Quist, Inc. analyst Bruce Lupatkin.

### Mac II takes on IBM PC

"Although some Mac II sales are going for nontypical PC uses like desktop publishing, that number pales beside those for general-purpose workstations that would otherwise have been IBMs or IBM compatibles," Lupatkin said.

"And 45% of Apple's sales came from the Apple II, so they haven't lost any share there," Lupatkin added.

For fiscal 1987, Apple's revenue reached $2.66 billion, a 40% gain over fiscal 1986's $1.9 billion. Profits followed the same pace, growing 41% to $217 million, or $1.65 per share.

Sun said the unexpectedly strong growth of its low-end Sun-3/50 and Sun-3/60 workstations contributed a sizable portion of its sales in the quarter. Revenue grew 108% to $191.7 million, and earnings gained 92% to $12.9 million, or 36 cents per share.

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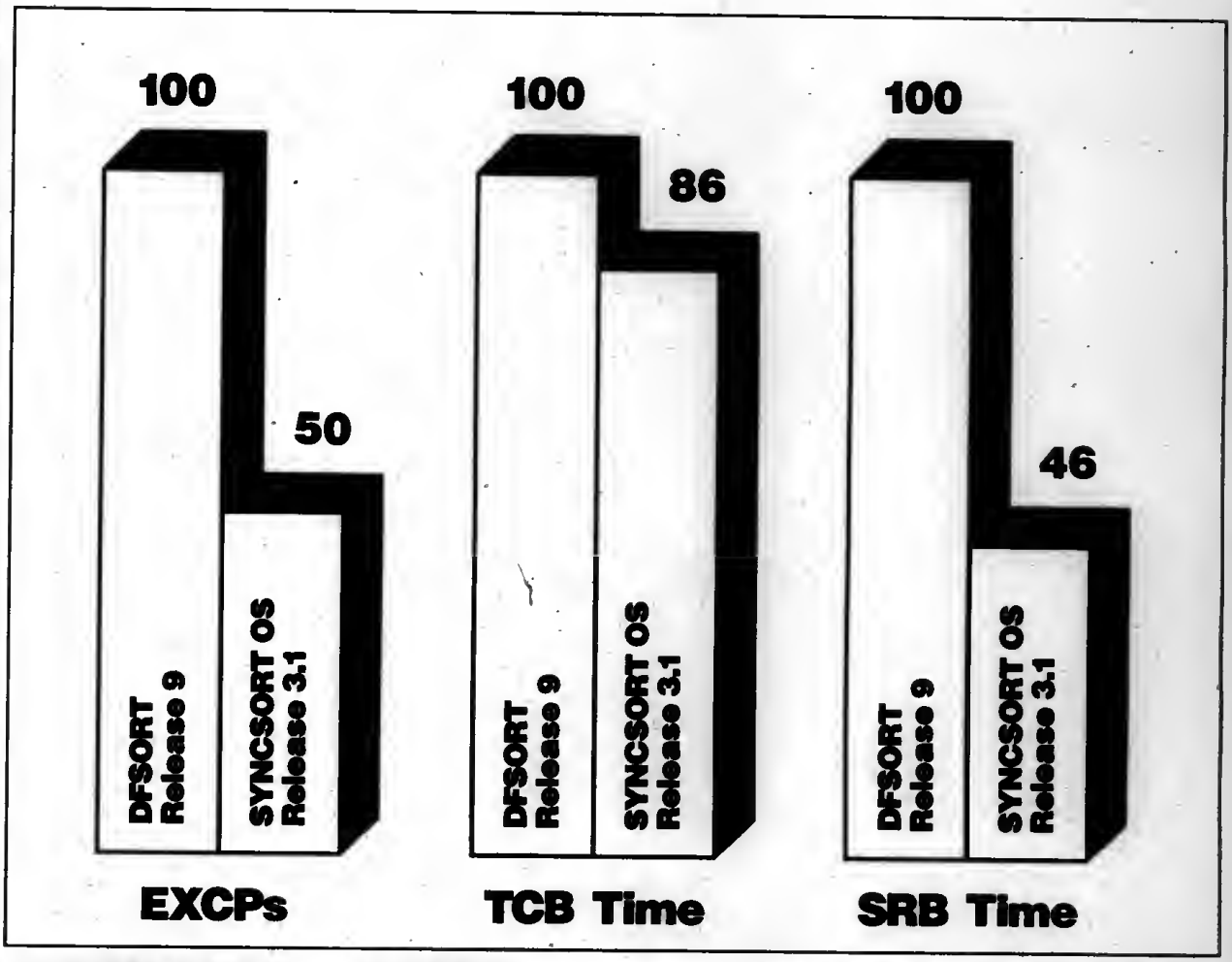


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# ETA extends supercomputer line down

BY JAMES CONNOLLY
CW STAFF

NEW YORK — The supercomputer arm of Control Data Corp., ETA Systems, Inc., last week filled out its product line with two low-end processors and, in doing so, claimed to have created a class of technical systems.

ETA positioned the air-cooled models of the ETA10 series in what the company said is a gap between near-supercomputers and supercomputers, including high-end ETA10 systems introduced in April and delivered to two customers.

Some analysts were skeptical about the appeal of the sub-$1 million ETA10 Model P and $1.2 million ETA10 Model Q because of their inability to run Unix until next year. But those same observers noted that ETA's move may force other companies to take a closer look at the price/performance ranges served by the new ETA models.

Among those who might be affected by ETA's announcement are Cray Research, Inc., Digital Equipment Corp. and near-supercomputer makers Alliant Computer Systems Corp. and Convex Computer Corp.

ETA claimed the new models outperform supercomputers like the Cray X-MP by providing peak performance of up to 947 million floating point operations per second (MFLOPS) and correspondingly high benchmarked performance ratings. The ETA10 Model P achieved a rating of 25 MFLOPS and the ETA10 Model Q achieved a rating of 62 MFLOPS running 64-bit Linpack 100 by 100 arrays.

The new ETA processors are priced at $850,000 for the Model P and $1.2 million for the Model Q, compared with $2.5 million for an entry-level X-MP. Base prices range from $100,000 to $450,000 for most vendors' near-supercomputers, which ETA claimed provide significantly lower performance than its new models.

Thomas C. Roberts, president of CDC's Computer Systems and Services Group, claimed none of the supercomputer or near-supercomputer vendors serve the market targeted by the new ETA models. "I think we have a very comfortable lead," Roberts said.

He said half of the processing power growth in the supercomputing field in recent years has been in the near-supercomputer market. But he claimed those systems fail to meet users' needs for growth paths.

### In reply

Analyst Michael Geran of E. F. Hutton & Co. in New York speculated that DEC, Alliant, Convex and several makers of parallel processors might answer ETA with their own systems. However, he and analyst Gary Smaby of the Minneapolis investment firm Piper, Jaffray & Hopwood, Inc. noted that Cray would have to change its philosophy of targeting the high end of the supercomputing market if it wanted to address ETA's low-end products.

"Cray wouldn't sell a $3 million X-MP/14SE if the customer wasn't eventually going to buy a $10 million X-MP," Smaby said. He noted that the marketing costs related to selling a supercomputer, which he said Cray has estimated at $500,000, raise a question of how successful ETA will be in selling low-end ETA10s through CDC's existing sales organization.

He said success by ETA could force Cray to reevaluate its high-end orientation.

"I think this does open a new market, in that there are customers who have been in the closet and wanted a supercomputer but couldn't afford it," Smaby said.

But he also cited a potential problem for the ETA10s in that ETA's Unix implementation will not be ready until the third quarter of 1988. "This box without Unix is like a ship without sails," he said.

"They've got an interesting plan here, but where's the software?" Geran asked.

ETA officials claimed that more than 100 applications designed to run on CDC's older Cyber 205 supercomputer will run under the ETA10s' EOS operating system.

One of the first customers to order one of the new models reported that having Unix available might help. But he said porting his existing software to EOS should be on more difficult than moving it to any other system.

Iain B. Findleton, chief of the Dorval, Quebec, computer center for Environment Canada Atmospheric Environment Service, said he expects delivery of a dual-processor ETA10 in March 1988. He said the service, Canada's primary weather forecasting organization, now runs a combination of Cray and CDC systems.

The ETA10 "has the same performance as a Cray-1 — even a little bit more power — and we can bring it in on wheels and plug it into a 60-Amp., 220V outlet," Findleton said. He said a utility company had to run special power lines when the weather service installed its first Cray.

The new ETA10 models use the same single-processor board as the original ETA10. They have slower clock speeds, however, (24 nsec for the Model P and 19 nsec for the Model Q) and are cooled by air rather than by liquid nitrogen.

In announcing the Models P and Q, ETA also designated the original 10½-nsec ETA10 as the Model E and a 7-nsec system due next year as the Model G. ETA has projected a peak performance rate of 10 billion FLOPS for the eight-processor Model G.

ETA compared the new models to departmental systems that operate in an office environment and demonstrated a Model P at the introduction. But while the CMOS-based processor ran without air-conditioning, its disk drives ran in an adjoining air-conditioned area because high-capacity disks for office environments will not be ready for ETA's use until early 1988.

The Model P is available now with one CPU. A dual-CPU Model P and the Model Q, with one or two CPUs, will be available in 1988. Each new model supports 8M to 16M words (64M to 128M bytes) of shared memory.

**Cool front**

*Air-cooled ETA10 Models P and Q are claimed to offer supercomputer performance at a much lower cost than the more traditional Models E and G*

| Model | P | Q | E | G |
|---|---|---|---|---|
| Cycle time (nsec) | 24 | 19 | 10.5 | 7 |
| Processors | One to two | One to two | One to four | Two to eight |
| CPU memory (bytes/CPU) | 32M | 32M | 32M | 32M |
| Shared memory (bytes) | 64M-512M | 64M-512M | 256M-1G | 512M-2G |
| Peak performance (FLOPS)[1] | 750M | 947M | 3.4G | 10.3G |
| Cooling | Air | Air | Liquid nitrogen | Liquid nitrogen |
| Maximum number of I/O units | Four | Four | Nine | 18 |
| Base price | $850,000 | $1.2M | $5.5M | $8.9M |

[1] Floating-point operations per second

INFORMATION PROVIDED BY ETA SYSTEMS, INC.

# Alliant seals performance hole with new minisuper

BY STANLEY GIBSON
CW STAFF

LITTLETON, Mass. — Seeking to regain momentum in the minisupercomputer field, Alliant Computer Systems Corp. is scheduled to announce today a new parallel processor priced starting below $100,000.

The FX/4 fills a performance gap between Alliant's FX/1 and FX/8 machines and is the spearhead of an effort to renew growth at the 5-year-old company, Alliant officials said. The new machine is slated to be shipped before the end of the year.

"This is the rollout of a new strategy, including a new family of machines with processors below the FX/4 in performance as well as above it," said Ronald Gruner, Alliant's president. He declined to say when the other products would be announced. Gruner added that Alliant will offer new software products and will begin direct sales in some international markets.

Recently, Alliant's profits have been below projected figures, resulting in a sharp slide in the price of the company's publicly traded stock. Alliant has grown at a rate of about 7% during the past nine months, according to Gruner, a much slower rate than previously.

The FX/4 is a one- to four-processor system that uses the Motorola, Inc. VMEbus and is fully compatible with Alliant's other models, according to Gruner. A single-processor version can perform 11.8 million floating point operations per second (MFLOPS), while a four-processor version can perform at a peak rate of 47.2 MFLOPS. A system with one computational processor, one I/O processor, 32M bytes of memory and 550M bytes of disk storage carries a $99,900 price tag.

The FX/4 will fill a need as a sort of "personal minisupercomputer," according to Vicki Brown, an analyst at International Data Corp. in Framingham, Mass. A highly paid engineer would be very interested in using the FX/4 as a dedicated processor, she predicted. An Alliant FX/8, in contrast, would more likely be shared by a number of users on a network.

Brown pointed to large companies, including aerospace giants Boeing Co. and Hughes Aircraft Co., as likely purchasers of the new system.

### Demand to grow

Gruner predicted that pricing a minisuper like the FX/4 below $150,000 will cause an immediate increase in demand.

Brown concurred, saying the FX/4's price would induce engineers to buy the machine. She said the FX/1 has been outselling the FX/8 at a rate of 4-to-1. "That shows there is a lot of demand at the low end. But the FX/4 lets you grow, too."

An FX/1, which starts at $99,500, is capable of 11.8 MFLOPS, like the FX/4. However, the FX/1 cannot grow beyond one processing board.

The base model FX/8 also starts at 11.8 MFLOPS, but it can grow to contain eight processors. The FX/8 starts at $285,000.

Alliant did not change the prices of its FX/1 and FX/8 systems, despite the possibility that they will be replaced within the next several months.

Brown suggested that the FX/4 essentially replaces the FX/1 because of the nearly identical price and comparable computing power for an entry-level system. Only a user with no intention to expand would purchase an FX/1, she said.

Gruner said Alliant will take over direct sales from Apollo Computer, Inc. in some foreign countries. Apollo had served as Alliant's foreign distributor. Although Apollo will continue that role in some markets, Alliant said it will be taking charge of its own efforts in West Germany, France, the UK and Japan.

Alliant also announced enhanced compiler and algorithm products.

Alliant's moves are geared toward renewing the company's vigor in an increasingly crowded market, according to Gruner. "Market share is the real objective," he said.

Assuming that Alliant's performance claims are accurate, Brown said the FX/4 offers higher performance for a lower price than machines from competing vendors like Convex Computer Corp. Convex, however, is expected to announce a new line of systems in December or January.

Drawing a parallel with the technical workstation market, Brown said Convex will be analogous to Apollo, concentrating on higher priced, higher performance systems. Alliant, on the other hand, will be similar to Sun Microsystems, Inc., focusing on lower cost, higher volume systems, she concluded.

# Ashton-Tate ties Dbase to System/36 use

BY DOUGLAS BARNEY
CW STAFF

TORRANCE, Calif. — In an effort to woo the more than 60,000 IBM System/36 users, Ashton-Tate last week announced a product that allows microcomputer users to access System/36 data files.

The product, called Dbase Direct/36, provides Ashton-Tate Dbase III Plus users with access to active System/36 files, which can also be downloaded to the microcomputer.

The package costs $1,695 per System/36 CPU, resides on the micro and provides extensions to the Dbase language.

According to Ashton-Tate product manager of connectivity Dwayne M. Walker, the user can also perform selective data extraction. "You only bring down what you work with, which cuts down on network traffic," he said.

**THE PRODUCT provides an incentive for MIS professionals to view Dbase as an applications development tool, according to Ashton-Tate.**

### Normal setup

The typical implementation would consist of the application and data manipulation functions residing on the microcomputer, with the data housed on the System/36.

"This lessens the burden on the System/36 processor," Walker argued. System/36 files appear to the user as Dbase files and are reformatted into the .DBF file format.

Dbase Direct/36 is especially handy for applications in which the same data needs to be accessed by both microcomputers and terminals. According to Walker, the product also provides an incentive for MIS professionals to view Dbase as an applications development tool.

### Warm reception

Users contacted last week generally applauded the concept behind Dbase Direct/36, especially given the low level of data base capability currently offered on the System/36.

"I would be interested in that product. The 36 does not have the data base capabilities of the System/38," said Michael J. Froggatt, MIS manager at S. L. Industries, Inc. "I can see the benefits of pulling general ledger or personnel records and downloading them to a PC."

Another user agreed. "The idea of downloading to a PC is what we want to do. We are very interested in looking at it," said Dennis M. Klinger, vice-president of MIS at Ryder Truck Rental, Inc., which has a System/36 with approximately 30 IBM Personal Computer AT's attached.

But Rodger Peck, president of the Peck Systems Group, a System/36 consulting firm, had reservations.

"I don't know if I want someone with PC intelligence playing with my files. You need to protect down to the field level," he said. "Security is always a problem in working with a host data file. Someone can walk away with a floppy disk."

Dbase Direct/36 works with any System/36 that uses IBM's SSP Release 5, has IBM's PC Support/36 installed and uses the Interactive Data Definition Utility. The product further requires an IBM PC or compatible, IBM's Enhanced 5250 terminal emulation or a compatible package and Dbase III Plus.

Dbase Direct/36 does not work with so-called Dbase clones, Walker said.

# AT&T reorganizes sales team

*Invigorates push into MIS market with 1,000-person transfusion*

BY ALAN ALPER
CW STAFF

NEW YORK — AT&T said last week it will provide its Data Systems organization with a dedicated sales group with skills appropriately matched to sell computer and related equipment to data processing professionals.

Effective Jan. 1, AT&T is scheduled to shift its 1,000-member National Data Sales Organization from its Business Markets Group, which handles both voice and data products, to its Data Systems operation.

The transfer of the computer sales force is the latest in a string of shifts taking place during the firm's three-year foray into the computer business. For the first time, AT&T will have an organization selling computers directly to business customers.

**Change in status**

In a related move, the Data Systems division was elevated last week to "Group" status under AT&T's top computer executive, Vittorio Cassoni.

Cassoni, who was promoted from executive vice-president to president, had reported to Business Markets Group President Sam Willcoxon but will now report directly to Randall Tobias, AT&T's vice-chairman.

AT&T said the National Data Sales Organization will be separated from the Business Markets Group because the skills and expertise required to sell computers to DP professionals differ from those needed to handle customer premises equipment such as telephone and private branch exchanges.

"The complex needs of data customers require dedicated, specially trained sales people," Willcoxon noted in a prepared statement.

The transfer of the sales organization to the Data Systems Group will make sales personnel more accountable to Cassoni and his data networking mission, a spokeswoman said.

The Data Systems sales organization will continue to work with the Business Markets Group's other telecommunications-related end-user sales groups, she noted.

"The company will continue to maintain a single point of contact for large business customers through the Business Markets sales force," Cassoni said in a prepared statement. "The Data Systems sales organization will work as part of these AT&T account teams to sell data products within integrated communications and data systems solutions or to sell them separately, whichever is appropriate for each customer."

**No surprise**

Analysts last week were not surprised by the moves. Cassoni has publicly lobbied for a dedicated Data Systems sales force as a prerequisite for making AT&T's computer business profitable. AT&T lost more than $1 billion on its computer operation last year, industry analysts estimated.

"AT&T is trying one more time to make it in computers, and they feel Cassoni has the potential to pull it off," said one analyst who requested anonymity. "He's always complained that he didn't have a sales force that was accountable to him, and now that's been rectified."

Cassoni joined AT&T almost a year ago from Ing. C. Olivetti & Co. in what many analysts believed was a last-ditch effort to salvage AT&T's participation in computers.

While Cassoni recently said he is cutting AT&T's Data Systems' losses, the firm, as a matter of policy, does not break out Data Systems' results.

In a related move, AT&T's Customer Programming Services Centers, which have functioned under AT&T's Network Operations Group and provide custom DP software, reportedly will be transferred to the Data Systems Group next year.

At the same time, product management and modem development will be transferred from the Data Systems Group to AT&T's Communications Systems division.

# AT&T, Sun to shake on RISC pact

BY ALAN ALPER
CW STAFF

NEW YORK — AT&T is expected today to reveal an agreement to license a Sun Microsystems, Inc.-developed reduced instruction set computer (RISC) architecture that AT&T intends to use as the platform for its next generation of high-performance workstations, sources close to both companies said last week.

Sun unveiled a 32-bit RISC architecture called Sparc, which stands for scalable processor architecture, when it introduced its Sun-4/200 family of workstations and network servers this summer [CW, July 13]. At that time, officials of the Mountain View, Calif., firm said the company would license the technology, operating system and related development tools and compilers to semiconductor and other systems manufacturers in hopes of making Sparc an industry-standard platform.

Sun and AT&T officials declined to comment on reports regarding the licensing of Sparc. John Hime, Sun's market director of hardware, said his firm expects a number of companies to commit to Sparc during the next six months. Sun, he said, is not worried that it is adding to the competitiveness of other workstation vendors by licensing Sparc. "For 5½ years, we've used the same CPU as all of our competitors, and we've done quite well," he said.

**Little risk**

Scott McNealy, Sun's president and chairman, said there is little risk in licensing RISC technology. "Licensing implies royalties," he said. "Even if you lose, you win."

In striking a licensing deal with AT&T, Sun would be embracing a nonthreatening partner that, to date, has not fared particularly well in the computer industry, analysts said last week.

"If Sun and AT&T sign such a deal, it is a positive endorsement of the Sparc architecture," noted Bob Herwig, an analyst with Hambrecht & Quist, Inc. in San Francisco.

The Sun-4 family offers approximately 10 MIPS of computing power, which the company has said provides the performance of a Digital Equipment Corp. VAX 8800 at about one-tenth the price. An entry-level Sun-4/260 deskside workstation with 8M bytes of main memory lists for $39,000.

*West Coast correspondent Julie Pitta contributed to this report.*

# Aging VSE

CONTINUED FROM PAGE 1

production-oriented shops — find multiple VSEs can handle their needs at a lower expense than MVS can, and they delay completing the migration. There were 3,138 IBM MVS/XA systems in 1986, or less than half the number of VSE systems, while the total number of IBM MVS/SP systems declined in 1986 to 4,632 from 5,510 the year before, according to Computer Intelligence.

Despite their large numbers, however, VSE users acknowledge that they are often handicapped by VSE's archaic procedures, particularly its method of lock-file management.

Jim Glasgow, manager of systems programming at Children's Hospital and Medical Center in Seattle, said his IBM 4381-14 was running at only 50% to 60% capacity due to lock-file contention as it processed the demands of five VSE systems running under VM. He said the contention was eliminated by installing Extend/VSE, a $7,500 product from Goal Systems International, Inc. in Columbus, Ohio.

**'Rolls-Royce price tag'**

"Extend/VSE was one of the products we put in to try to avoid conversion to MVS," Glasgow said. "MVS is a wonderful product, but it's got a Rolls-Royce price tag."

Extend/VSE, Softkey, Vlock/VM from BMS Computer, Inc. in Walnut Creek, Calif., and Cache Magic LF, a $5,000 product from SDI in San Mateo, Calif., are among the products that address the lock-file problem associated with multiple VSE systems.

VSE typically creates multiple, time-consuming I/Os to disk each time a VSE user attempts to access a record. A lock file on a shared DASD controls access to all records, and a request for a record prompts VSE to generate an instruction to the lock file to retrieve it. If the record is locked, the lock file rejects the request, and it goes into a brief wait until VSE can try again, explained John A. Rankin, Goal Systems' product manager for Extend/VSE.

Heavy contention results in frequent waits and a lot of wheel-spinning by VSE as it repeatedly tries to access a record. The situation is aggravated by the VSE lock file's ability to report a false lock or an indication that "a record is in use when it's not," Storer's Woodward said. That fault is tied to the lock file's hashing technique that has no collision-avoidance algorithm, so when similar keys point to matching record numbers on different disks, a collision occurs that rejects one of those requests, he said.

Although the new products resolve this contention in different ways, they tend to take two basic approaches. Both Softkey and Vlock/VM add a module to the nucleus of VM that intercepts requests to the disk VSE lock file and steers them to a virtual lock file. Because that lock file is located in main CPU memory, it handles requests more quickly than accessing disks.

The Extend/VSE product requires no modifications to VM and, instead, uses an IBM Conversational Monitor System (CMS) virtual machine under VM as a server. The requests to disk are intercepted while still in VSE and carried via a channel-to-channel adapter to the CMS machine, which has no user terminal attached to it so it can serve as the lock-file manager, Goal Systems officials said.

SDI officials could not be reached for comment, but users who evaluated Cache Magic said it creates a lock file in the CPU cache.

**Solved problem**

Robert Cron, technical support manager at Restaurant Enterprises Group, Inc. in Irvine, Calif., pushes 12 million to 15 million transactions a day through six VSE systems running under VM/High-Performance Option. Cron's department was experiencing a lot of DASD contention, which was resolved by installing Softkey.

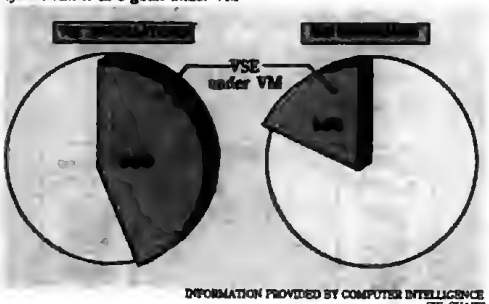
"On the average, we're experiencing 22% improvement in throughput," he said.

Unlike many VSE users, Cron said he looks forward to converting to MVS but finds his staff of 15 tied up converting McCormack & Dodge Corp. applications to M&D's Millennium environment. "If the growth we're seeing continues, Softkey buys us more time to get to MVS. I would say it's bought us another year," he said.

David V. Lewis, VM and VSE systems programmer for West Coast Life Insurance Co., said his firm's use of Vlock/VM has saved 5% of CPU time for his three VSE systems.

**Big slice of the pie**

*Nearly half the systems using VSE as a primary operating system run it as a guest under VM*

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CW CHART

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|---|---|---|---|
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# Sun nets CASE environment

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. last week introduced a computer-aided software engineering environment (CASE) intended for use over a network in large development projects.

Called the Network Software Environment, it allows multiple developers on Sun 32-bit workstations to share tools and program files across the network and keep a library of source code changes.

The library, called the Version Control System, maintains a record of each version of a program and related objects, such as design documents, project requirements, test data and drivers. The library keeps a history of all objects by saving changes to successive versions, which allows them to be recreated at any stage of their development history, Sun officials said.

In addition to supplying the underlying framework for a common development environment, Sun President Scott McNealy said, other vendors' CASE tools will be integrated into the network, although only two were mentioned with the announcement of Sun's product. They were Cadre Technologies, Inc.'s Teamwork family of front-end systems analysis tools and Interleaf, Inc.'s Technical Publishing Software for document preparation.

The Network Software Environment allows concurrent access to development objects and prevents one developer's work from interfering with another, Sun officials claimed.

In addition, Sun officials said they will provide a single interface to all network functions for CASE tool integration. The single program interface will reportedly allow developers to tie their own tool sets into the network.

Network Software Environment is set to be available in first-quarter 1988 for $2,500 per workstation, with networked installations eligible for a discount.

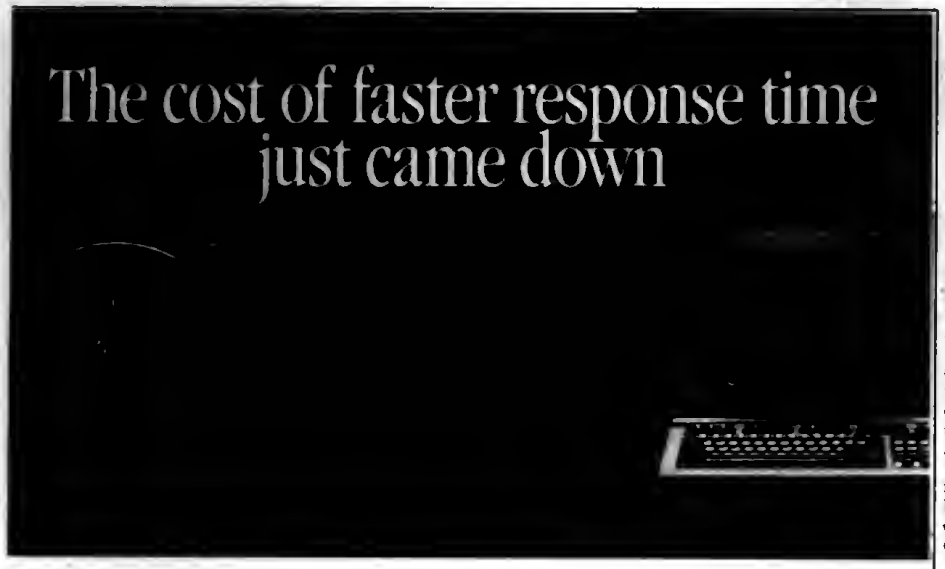
The development environment and Sun workstations run under a merged Unix operating system that includes both AT&T's Unix System V and the University of California at Berkeley's Unix 4.2.

In addition, Sun officials announced a networked project management software package, Suntrac, to handle complex development projects.

It is available immediately for Sun-2, Sun-3 and Sun-4 workstations at a price of $2,495 with volume discounts available.

CASE-related products make up about 40% of Sun's revenue. The Network Software Environment will help fuel hardware sales, McNealy said.

"It's an area that they've been in for a while," said Brian Boyle, industry analyst for Novon Research Corp. "It's just a next step."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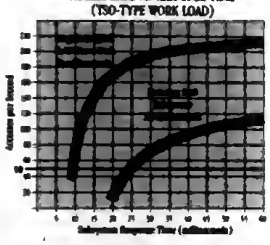

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# Arcnet boosters form trade group

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — More than 30 vendors that base their hardware and software on Arcnet met here last week, both to form a trade association to promote the token-bus networking architecture and to seek recognition for Arcnet as an international standard.

Datapoint Corp. Chief Executive Officer Robert J. Potter, whose firm invented the Arcnet protocol in 1976 and marketed it in 1977, urged the Arcnet Trade Association (ATA) members to try to make Arcnet an IEEE standard.

An earlier attempt to standardize Arcnet failed in the early 1980s, ATA members said, when Datapoint refused to facilitate the connection of non-Datapoint equipment to Arcnet.

"In the past, they have been reluctant to do that," said Harry Saal, president of Network General Corp. in Sunnyvale Calif. "But now we feel they've turned the corner on holding Arcnet as a proprietary protocol."

**Still cost-effective**

Despite the decline of Datapoint's U.S. business and the emergence of other local-area network (LAN) technologies, 2.5M bit/sec. Arcnet is still viewed as a cost-effective LAN in comparison with others, such as Digital Equipment Corp.'s Ethernet standard.

There are more than 500,000 Arcnet nodes in the world, linked in 80,000 LANs, Potter said.

As many as half of these Arcnet nodes are accounted for by Novell, Inc.'s LAN installations. "My guess is 80% of the Arcnet nodes are not in Datapoint LANs and that Novell has the bulk of the non-Datapoint nodes," said John A. Murphy, who designed Arcnet while employed at Datapoint in 1976.

Five companies founded ATA, which was incorporated in August: NCR Corp. and Standard Microsystems Corp. in Hauppauge, N.Y., both of which make Arcnet interface chips; Datapoint; Gracon Services, Inc., an East Lansing, Mich., systems integrator; and Contemporary Control Systems Inc. in Downers Grove, Ill.

They, along with 30 others, plan to meet regularly and to demonstrate Arcnet technology at trade shows.

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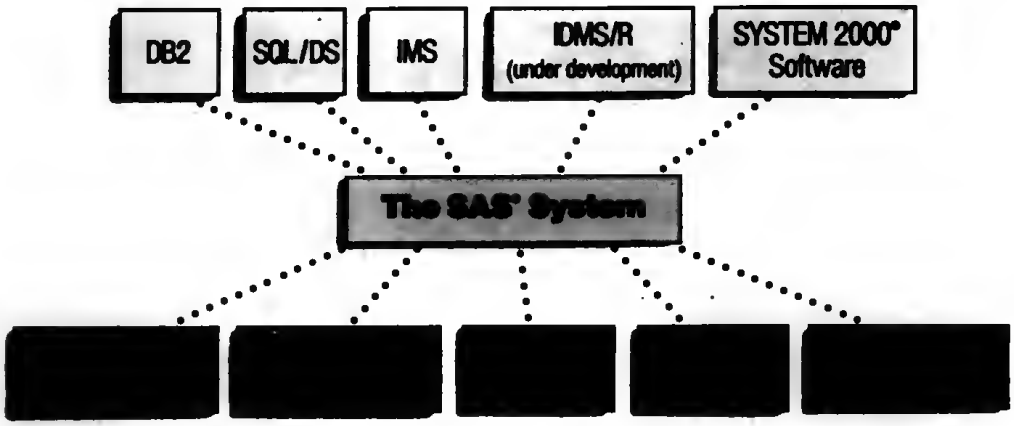


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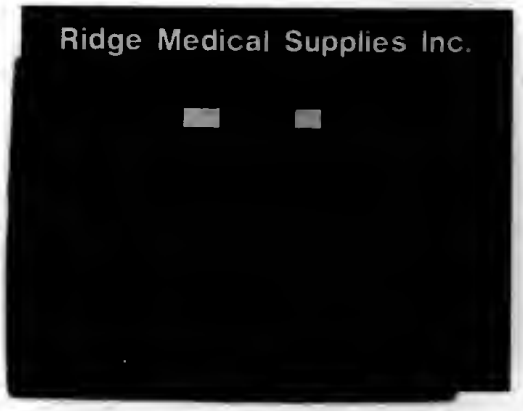


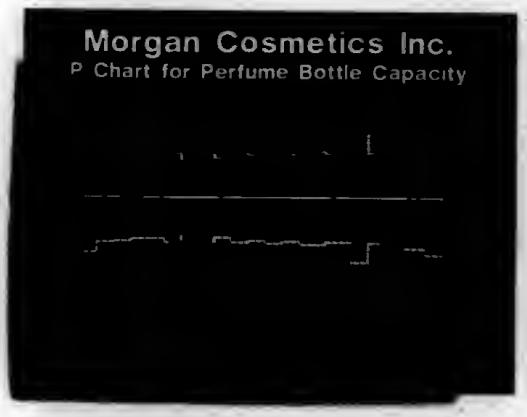

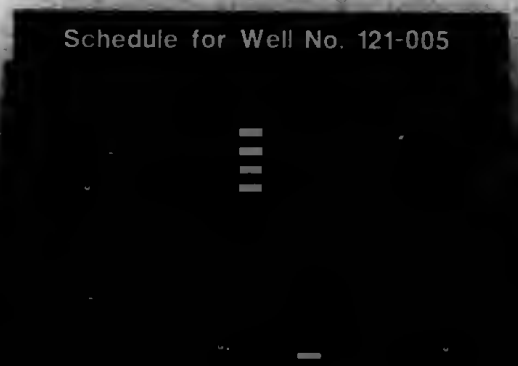

# Chip set may chop PS/2 board costs

*Developer says product to lead to more feature-rich Micro Channel cards*

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — Chips and Technologies, Inc. is slated to unveil today an interface chip set for IBM's Micro Channel architecture that the vendor said will lead to the development of less expensive and more function-packed enhancement boards for the IBM Personal System/2 line.

By shrinking the Micro Channel interface into a single chip set, board makers will be able to pack more functionality onto their PS/2 enhancement cards and will not have to develop interfaces themselves. That could cut development and retail board costs by as much as 50%, according to Raj Jaswa, product manager for Chips and Technologies' systems logic division.

"So far, enhancement cards for the Micro Channel have offered only simple functions, like additional memory," Jaswa said. "But with our chip set, you will see more true multifunction cards coming out with applications like facsimile and scanner emulation, among other things."

**Interested and concerned**

Some 15 to 20 board makers have shown interest in the chip set, Jaswa said. He added that the first boards using the chip set should be available in the first quarter next year.

However, many board makers have already designed their own Micro Channel interfaces, and some said they are concerned about relying on a single outside source for a custom interface logic.

"If a vendor designs custom integrated circuits to add memory, they'll usually incorporate a Micro Channel bus interface into those integrated circuits," said Martin Alpert, president of Cumulus Corp., a PS/2 enhancement board maker in Cleveland. "There's also the risk of going with a single source for custom logic," Alpert added. "But for those board companies that are not ready to build their own custom logic, this gives them a quick, easy way into the market."

Although Chips and Technologies' Microchips set will enable board makers to adapt their existing IBM Personal Computer cards to the Micro Channel architecture, that ability does not necessarily ensure that the board will take full advantage of the PS/2 features, Alpert said.

The Microchips interface chip set will reduce the space occupied on a Micro Channel board by as much as 20%, according to Jaswa.

# Corporate Software develops upgrade service

BY ED SCANNELL
CW STAFF

WESTWOOD, Mass. — Corporate Software, Inc. has introduced a service program that it claimed makes it easier and more cost-efficient for corporate information center managers to support large numbers of users.

Appropriately called the Service Plan, the program includes a data base of answers to specific product support questions, a biweekly customized report on the latest changes to a firm's core products and a quarterly summary of procedures required to upgrade major vendors' software.

"The goal is to minimize the repetitive tasks that largely shouldn't be done by a skilled information center person, like what the latest version of something is," said Mort Rosenthal, Corporate Software's chief executive officer.

The basic service is for firms that spend at least $3,000 per quarter and includes the *Corporate Software Guide*, a reference book evaluating more than 700 IBM Personal Computer and Apple Computer, Inc. Macintosh products.

Companies spending more than $12,000 per quarter receive reports on upgrades to major products, a monthly technical publication listing bug-fix information and free copies of new products. Those spending $60,000 get the Instant Upgrade program, which aids information managers who frequently upgrade large numbers of users, the firm said. The Service Plan is available immediately.

# Terminal emulation costs headed down

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — Quadram Corp. will announce today a low-cost IBM 3270 terminal emulation card for the IBM Personal System/2 Models 50, 60 and 80.

Using a single-chip 3270 protocol controller from Chips and Technologies, Inc., which claims it is the first such device, Quadram's board is expected to compete directly with the Digital Communications Associates, Inc. (DCA) Irma series of emulation boards on a price-point basis.

Quadram confirmed the announcement but would not disclose pricing details. However, a Chips and Technologies spokesman said his company's customers could offer Irma-compatible 3270 emulation boards for as little as $400. DCA's Irma 2 board, in contrast, currently retails for $800 to $1,200.

Chips and Technologies' 3270 emulation product reduces the amount of necessary logic chips on a board from about 45 to eight, making half-size Irma cards more viable.

Using the 3270 chip and an IBM Micro Channel architecture interface microprocessor that Chips and Technologies is also scheduled to unveil today, Quadram will reportedly be able to offer Irma-compatible boards for the IBM Personal Computer and PS/2 series.

A spokesman for DCA said the firm would not comment at length on the competitive boards until after Quadram's press conference. A Quadram spokesman said his company will give full details of the announcement today.

**Software the issue**

"The important issue here is not hardware but software," said Bill Marks, a DCA spokesman. "We have made a lot of software changes to our product in the last few years, and it's the software that really drives the product."

Currently, DCA has 60% of the 3270 emulation market. Its most significant competitor, IBM, holds about 30%, and the other 10% is up for grabs, according to Mark Dunkel, a technology analyst with Robinson Humphrey Co. in Atlanta.

But Quadram's announcement should not have a major impact on DCA, analysts said, because of the company's strengths in marketing, support and software.

"Irma has really evolved in the past few years," Dunkel said. "It's not just a hardware product but a strong support- and software-oriented product."

Nonetheless, there is a "sizable market potential" in selling Irma-compatible boards that "do 60% of what Irma does for 60% of the cost," Dunkel said.

DCA is a potential customer for the 3270 processor chip set as well, according to analysts and Chips and Technologies officials.


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# DEC net controls

CONTINUED FROM PAGE 1

to manage different components and aspects of a Decnet system. But some of these same companies complained about the absence of an overall management system that would bring all of those packages together.

MIEMSS' Guenon thought he had found exactly what he was looking for at Decworld: a system that displayed status and diagnostic information about different components or areas of a Decnet that linked the entire conference area.

"They were running a different Decnet management product in each of four windows on the screen, each with its own graphics display," Guenon said. His company wants to use such a system to centrally manage a new corporate site.

Unfortunately, DEC does not offer such a centralized network management system as a commercial product — yet.

"Every piece you saw at Decworld can be made available," Grenier said, "although not necessarily as a specific [commercial] product."

### Turning toward generic answer

The vendor's service organization can tailor such a system to an individual customer's needs, Grenier explained, adding that DEC intends to "solve these problems in a more generic way" by next year's Decworld as part of its new focus on enterprise networking.

Far from producing a Netview clone, however, DEC intends to continue distributing management functions across its networks and also provide managers with the option of consolidating certain data elements in a central place for viewing, storage and later analysis, Grenier indicated. "It doesn't matter where the data originally resides, as long as I can get it and it's current," he said.

Interestingly, Decnet and Netview do not seem to compete for the title of corporatewide network management system, because companies with both systems tend to keep them separate.

"IBM equipment is handled by a completely different side of the house," said MIEMSS' Guenon. "We only handshake with them over DEC's SNA gateway."

"We really have three networks," said Richard Crane, director of systems operation and telecommunications at Gillette Co., where DEC computers and IBM Personal Computers are linked on an Ethernet running Decnet.

IBM computers on an IBM Systems Network Architecture (SNA) network can talk to DEC computers via a gateway from Interlink Technologies, Inc. And a variety of asynchronous and synchronous devices are linked over an AT&T Integrated Systems Network (ISN).

Gillette began using IBM's network management products "long before they became components of Netview," Crane said.

The Boston-based company is now looking at DEC management tools for the Decnet installation and wistfully hopes that AT&T will "improve ISN's diagnostic capabilities," he added.

"It is not a major concern for us to bring all of the networks under one management system," Crane said. "I'd much rather use a vendor's own tools to manage its network. You lose something with a generic system."

Another direction in which DEC is moving — albeit too slowly for some users — is toward extending its management functions to other vendors' products.

This cannot happen too fast to suit Pitney Bowes, Inc. The Stamford, Conn.-based firm's corporate engineering and technology division is looking for a way to manage a heterogeneous network of DEC VAXs and Microvaxes, assorted personal computers, Apollo Computer, Inc. and Sun Microsystems, Inc. workstations and AT&T 3B computers.

"I want a package that will cut across vendors; that will allow me to manage the whole network as if it were a single computer," said George Billings, a manager of the company's network and computer operations.

Billings has been evaluating DEC's LAN Traffic Monitor and NMCC/VAX Ethernim, both of which can keep track of traffic and utilization on a mixed network of DEC and non-DEC systems.

Ethernim detects when nodes are on or off the network. The Monitor can keep track of nodes' utilization of the network and can compare frequency of packets using Decnet, Transmission Control Protocol/Internet Protocol and Sun's Network File System protocols. This is a key function for Pitney Bowes, which uses all three.

> "IT IS NOT a major concern for us to bring all of the networks under one management system. I'd much rather use a vendor's own tools to manage its network. You lose something with a generic system."
>
> RICHARD CRANE
> GILLETTE CO.

While he said he feels that DEC may be further along than any other vendor in extending its management tools to other companies' products, Billings emphasized that there is still room for improvement.

For example, Pitney Bowes would like to use DEC's Remote System Manager to back up remote files and perform software updates for remote non-DEC systems. Currently, the software only works with DEC's VMS and Ultrix systems.

### Links through OSI expected

DEC plans to link other vendors into its network management system through the Open Systems Interconnect (OSI) protocols as soon as those protocols are stable enough, Grenier said.

The computer company reportedly is working with third-party vendors to provide OSI-based links to non-DEC systems and is expected to announce these offerings at next year's Enterprise Networking Event '88 International.

Pitney Bowes' Billings was less than reassured by DEC's promises to provide true multivendor network management through OSI protocols that he described as "still completely up in the air."

Meanwhile, Billings is still looking at other vendors' networking and management tools. "One main reason we have a multivendor network is not to be dependent on any one company," he said.


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# Informix, Innovative to merge

*Firms set February date for $82M union targeting large users*

BY ALAN J. RYAN
CW STAFF

MENLO PARK, Calif. — Informix Corp. and Innovative Software, Inc. announced late last week that they intend to merge their companies, creating a single firm that will heavily target corporate America and government markets.

The companies executed a letter of intent on the merger, which is valued at approximately $82 million, based on the closing Informix stock prices last Wednesday. The deal is expected to be completed by February.

According to Wynne Jennings, vice-president of finance at Innovative, the merger will help increase the presence of both companies in the government market. "The government is a big user of Unix and Xenix and those kinds of systems. Together, our opportunities in the government market will be greatly enhanced," he said.

One area in which the merged companies will concentrate is office automation, Jennings said. "We're planning to come up with an office automation solution using an SQL-driven engine," he added.

Jennings said the two firms will work on "a total solution, providing integration over the user interface and integration over the data. We'll be able to provide it all, regardless of what operating system you're using, whether it is Unix, VMS or DOS."

Informix, through its wholly owned subsidiary Informix Software, Inc., is strong in SQL applications, development tools and data base management systems for the Unix, DOS, IBM MVS and Digital Equipment Corp. VMS marketplace. The company employs approximately 350 people.

Innovative designs, develops, markets and supports a product line of applications such as spreadsheets and word processing, and its power lies primarily in the Unix marketplace and the high-end DOS marketplace.

**Like bacon and eggs**

"The complementary nature of the stocks is extraordinary," said David Thomas, an analyst with Hambrecht & Quist, Inc. "There is little or no redundancy in the products of the two companies."

According to Dick Murphy, vice-president of corporate development at Informix, the discussions on merging the companies came about while the two firms were negotiating the joint marketing of a product.

Thomas noted that both companies have strong direct sales, and each has strong OEM relationships with various vendors. "They're both growing at practically the same rate," he added. "The synergies are very bullish."

> "I WAS surprised to see the [Informix and Innovative Software] merger price that low."
>
> CHARLOTTE WALKER
> L. F. ROTHSCHILD & CO.

Charlotte Walker, an analyst with L. F. Rothschild & Co., agreed. "The assets that each of them bring to the table are very powerful. The merger makes an awful lot of sense," she said, but added that Informix fared quite well financially in the deal. "I was surprised to see the merger price that low," she said.

According to the terms outlined in the letter of intent, Roger J. Sippl, founder of Informix, will be chief executive officer and chairman of the board of the combined companies.

Michael J. Brown and Mark R. Callegari, cofounders of Innovative, will be president and chief operating officer and vice-president of advanced product research, respectively. They will likely remain at the Innovative facility in Lenexa, Kan., after the merger, and Sippl will most likely remain here, Murphy explained.

According to the terms of the letter, Innovative shareholders would receive three-fourths of a share of Informix common stock for each share of Innovative common stock. Informix shares would be reserved for issuance upon the exercise of Innovative's outstanding debentures on the same basis.

# Wordperfect DBMS spices up bland PC Expo

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Wordperfect Corp. demonstrated its unannounced Dataperfect data base management system for IBM Personal Computers and compatibles at the PC Expo show here last week. Dataperfect is scheduled to be announced officially at next month's Comdex/Fall '87 show in Las Vegas.

Described as a relational DBMS, Dataperfect is a companion product to Wordperfect that allows users to merge DBMS records with Wordperfect documents.

The announcement is also a competitive move against Ashton-Tate, the Torrance, Calif., maker of Dbase III, and Microrim, Inc., the Bellevue, Wash., manufacturer of R:Base. Until now, many Wordperfect users had relied on the product's Convert function to gain access to those DBMSs.

**Saving steps**

"No word processing package that we knew of was completely compatible with the widely used DBMS packages for personal computers, R:Base and Ashton-Tate's Dbase," said Kent Fuge, special projects coordinator for Wordperfect's marketing group. "Usually," he added, "you have to export the data and go through several processes to get it compatible with Wordperfect or with other packages."

The design of Dataperfect, however, will allow users to merge a form letter written in Wordperfect with a mailing list of customers' names stored in Dataperfect fields, Fuge said.

Other suggested applications for the product include inventory, payroll and time-and-materials accounting.

Individual fields in Dataperfect may run to 32,000 characters, and as many as 16 million records may be stored in the DBMS. A test version of Dataperfect at Wordperfect's Orem, Utah, headquarters held 297,000 customer records in 35M bytes, according to Fuge.

The package was written over a period of two years by Lou Bastian, brother of Wordperfect founder Brian Bastian. A single-user version of Dataperfect will be priced at $495; a multiuser version for networked environments is also planned. The networked product, which has not been priced, will run on 10 local-area network packages, including Novell, Inc.'s Netware and 3Com Corp.'s Ethernet and 3+ software.

**No thanks, we'll pass**

Few firms chose to use PC Expo for new product announcements, with most participants electing to wait for Comdex. PC Expo show managers estimated that 15,000 people attended the exhibition at McCormick Place during the three days it lasted.

However, attendance at floor exhibits was sparse, and many visitors stopped in only for short periods.

Personal computers are so widely used that they are finally finding their way into the executive suite, according to PC Expo keynote speaker Bernard Sergesketter, vice-president of AT&T's Business Markets Group, Central Region.

Sergesketter said he has gotten so accustomed to his AT&T 6300 and 7300 IBM-compatible computers that he receives electronic mail in his home after-hours and reviews mainframe reports on his PC at work.

"I can go away on a business trip and page through all that has happened in about 20 minutes," he said. "Now, I can get up to date quickly, and I don't have a stack of papers facing me each morning."


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# NEC Unix shift solidifies

*Firm to add four departmental systems at Unix Expo*

BY JAMES CONNOLLY
CW STAFF

BOXBORO, Mass. — NEC Information Systems, Inc. is scheduled next week to complete its year-long move into the Unix-based departmental systems market with the introduction of four systems supporting up to 32 users.

The products, scheduled to be introduced at the Unix Expo show in New York and outlined in NEC press briefings last week, include four models of the Astra XL family. Those systems are based on 16.7-MHz Motorola, Inc. 68020 microprocessors and NEC's ASTR-IX operating system, which is based on AT&T Unix System V with University of California at Berkeley BSD 4.2 extensions.

Part of NEC's strategy is to price the systems 10% to 15% below competing Unix systems and to keep the entry-level price at a point comparable to personal computers, according to Tim Corkery, director of business systems marketing for NEC. Corkery said prices will be finalized this week but added that those prices are expected to range from around $8,500 for a base MicroXL configuration to about $22,000 for a basic Astra XL/32 system.

**Small packages**

The high-end XL/32 carries the same name as NEC's existing Unix-based system, which was introduced last year essentially as a prototype for software developers.

Corkery said the new XL/32 is source code-compatible with the original system while being half the size and supporting more disk storage than the prototype.

The four Astra XL models are the eight-user MicroXL and XL/8, the 16-user XL/16 and the 32-user XL/32. The entry-level MicroXL is a deskside system that can be expanded to support 16 users but cannot be upgraded to the other models. The XL/8 can be upgraded to a 16- or 32-user system, Corkery said.

The models support from 2M to 16M bytes of memory and up to 2.5G bytes of disk storage. NEC is positioning them as departmental systems and small-business systems for general accounting and vertical markets, including telephony, hospitality, health care, law, manufacturing, construction, government and education.

Corkery said NEC is counting on those third-party software vendors to make Unix easier for commercial customers to use. "We probably are looking more at the evolving Unix market rather than the one that is there now," said Corkery about targeting the commercial market instead of the technical-computing market.

Corkery said the Astra XL line was designed to compete with Unix-based systems sold by vendors such as Altos Computer Systems, Inc., AT&T, NCR Corp. and Convergent Technologies, Inc.

He said the new systems are unlikely to compete with the existing Astra 300 line of small systems, which run NEC's ITOS operating system. Corkery also said the ITOS-based product line will be expanded next month with the introduction of an Astra 400 at Comdex/Fall. He said the Astra XL systems will be available in December.

# Kodak dishes up nonstick diskettes

BY ALAN ALPER
CW STAFF

NEW YORK — Teflon, the substance that made possible nonstick pots, pans and politicians, is now being used to protect floppy diskettes. The manufacturer, Eastman Kodak Co.'s Verbatim Corp. subsidiary, claims the media are almost impervious to accidental mishandling that could cause data loss.

Verbatim last week introduced a new line of 5¼-in. floppy diskettes that are coated with Teflon in order to resist substances such as coffee, smudges and fingerprints.

Any substance remaining on the recording surface after being cleaned will be absorbed by the floppy's jacket lining when the diskette begins to spin, Verbatim officals said.

The firm turned to teflon coating, developed by Du Pont Co., in response to focus group studies that found that accidental damage to diskettes caused by mishandling is a chief concern of computer users, both in the office and at home. Accidental loss of data due to mishandling is still a problem, Verbatim officials contended, since many users still do not back up data.

Analysts were divided on the virtues of teflon-coated floppies. Some claimed accidental mishandling is not as big a problem as defectively manufactured diskettes that are not tested properly. Others contended that protecting users from accidents is a useful function.

"To me, anything that makes floppies more reliable is a good thing," noted David Vallenti, an analyst at International Data Corp. in Framingham, Mass.

Verbatim's teflon-coated diskettes are being marketed under the name Datalife Plus and will be available starting next week through the firm's resellers. A package of 10 diskettes is expected to retail for between $15.99 and $16.99 — approximately 15% more than Verbatim's existing product line.

**You get what you pay for?**

"We think that users will be willing to pay a little more for a product that is demonstrably better," said Mark Welland, Verbatim's vice-president for marketing and sales for North America.

Datalife Plus will initially come preformatted in a 48 track/in. format for the 360K-bit diskettes used by the IBM Personal Computer and compatibles. The company will release preformatted diskettes for IBM PC ATs and compatibles in the second quarter of next year, Welland said.

The teflon-coating process will not be used with 3½-in. floppies, because those diskettes come with a hard jacket and shutter that protect them from being damaged by foreign substances.


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# Gates paints picture for MIS execs

BY DAVID A. LUDLUM
CW STAFF

SEATTLE — Information systems executives preoccupied with a jumble of aging, dissimilar systems were handed a graphical view of the future by Microsoft Corp. Chairman Bill Gates at the 19th annual conference of the Society for Information Management last week.

Gates predicted that within three years, 80% of all personal computers will have a graphical user interface like the one Microsoft is developing with its Windows products and the Presentation Manager component of the forthcoming IBM OS/2 operating system.

Gates recommended that information systems managers "move people to a standard user interface as soon as you can," thus saving support costs, and evaluate Microsoft's MS OS/2 for various applications. He noted that even people at his company are not sure when applications running on MS OS/2 will be available.

Gates also said microcomputers running MS OS/2 will be as sophisticated as minicomputers and mainframes now in use. He said about half the independent developers working on MS OS/2 applications had previously developed programs for those larger computers.

**Out with the old . . .**

Microsoft is exploring compact disk (CD) technology with a large research team, Gates noted. "You're going to see lots of things that had been in paper form in electronic form," he said, citing as an example the use of CDs to replace cumbersome parts manuals.

Most of the discussion by other conference speakers and the 500 managers attending, however, revolved around controling information resources and making systems already in use more effective.

Concerns at the gathering included mutual understanding among information systems executives and general managers, justifying expenditures on systems and linking isolated systems. Robert L. Dryden, president of Boeing Computer Services, Inc. and another keynote speaker, said Boeing has improved productivity with systems since the 1960s but has created "islands of automation."

Dryden said the critical technological issues facing information systems executives are a lack of communication standards, inadequate development tools and a need for common data base formats.

He advised information systems managers to regard information, such as engineering specifications, as a strategic resource and part of a "design/build process" that results in a product.

Managers attending the conference said they share Dryden's concern with islands of automation. George F. Clancy Jr., director of information systems at Citizens Gas and Coke Utility of Indianapolis, said he is trying to pull together pools of information into a company resource available to everyone who needs it.

**Things to work on**

"Having data and making it available to everyone across applications and across organizations — that's what we haven't done very well," Clancy said.

Many at the conference cited business issues in describing their greatest concern. Norman A. Matusek, MIS manager at B. F. Goodrich's Chemical Group in Cleveland, said he seeks answers to practical questions raised in trying to implement visions of strategic information systems, such as whether inventory information and other internal data should be shared with customers.

Justifying systems is the biggest issue facing David A. Scheibe, chief of the office of management in the Information Systems Division of the Washington State Department of Transportation. "How do you measure if you're automating the right thing — getting the right return? Return-on-investment by itself doesn't do it," Scheibe said.

# Industry group supports Air Force Unix standard, shells DEC protest

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A federal appeals board is expected to rule this week on Digital Equipment Corp.'s protest of a U.S. Air Force computer procurement that requires the Unix operating system. The case has turned into a major industry battle over proprietary and open system architectures.

In the latest development, the Computer & Communications Industry Association (CCIA) took the unusual step of filing a brief that supports the Air Force position. The brief also blasts the DEC protest as anticompetitive.

DEC, joined by Wang Laboratories, Inc., argued in its Aug. 12 complaint that the Air Force specification improperly favors AT&T as a bidder because it requires operating systems that conform to AT&T's Unix System V Interface Definition, as measured by AT&T's verification suite [CW, Aug. 24]. DEC and its supporters said the government should specify functional requirements, not operating systems.

The contract, worth an estimated $3.5 billion, is for 20,000 multiuser computer systems and must be awarded through full and open competition.

The CCIA, a trade association of 54 companies, said the Air Force specification will promote competition and software portability because Unix System V is an open operating system that is freely licensed to numerous hardware and software vendors on reasonable terms. Proprietary operating systems such as IBM's MVS/XA and DEC's VMS are not freely licensed, it said.

The Air Force only required vendors to offer operating systems that conform to the System V Interface Definition, which allows a wide variety of AT&T-licensed systems or totally independent systems to be offered, the CCIA said.

"DEC's protest is defective because it attempts to blur the critical distinction between closed, proprietary operating systems and an open, nonproprietary definition of an interface, which leads to open operating systems," the CCIA brief said.

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# IBMers take Nobel Prize

IBM researchers last week were awarded the company's second consecutive Nobel Prize for physics as two IBM scientists were honored for their work on superconductors.

The Nobel committee said that J. Georg Bednorz and K. Alex Mueller of IBM's Zurich laboratory will receive the award for their 1986 discovery that a class of oxides becomes superconducting at temperatures significantly higher than the previous limit, established 13 years earlier.

Last year, IBM scientists Gerd Binnig and Heinrich Rohrer received the Nobel Prize for physics in connection with their invention of a scanning tunneling microscope that allows surfaces of materials to be seen at the atomic level.

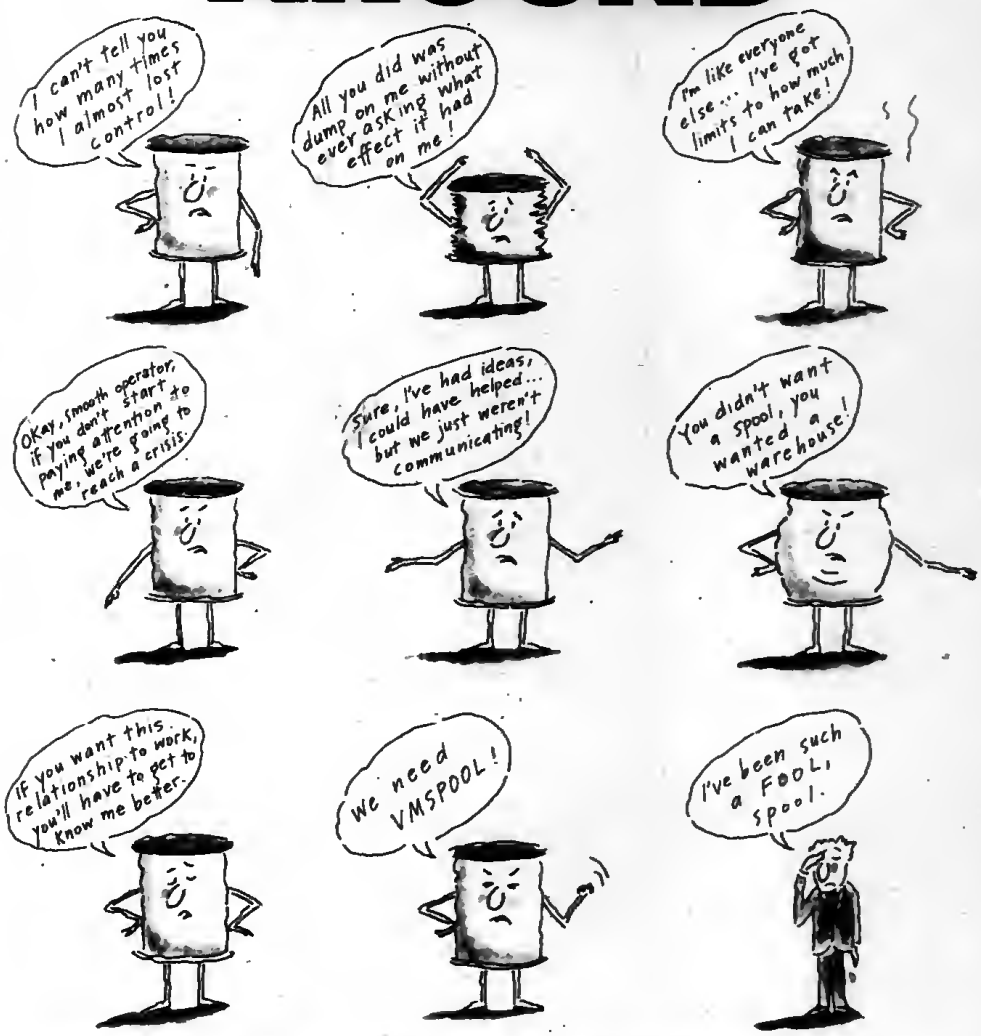
IBM officials credited the work of Bednorz and Mueller with leading to a string of developments by IBM researchers and scientists in other organizations.

The work of Bednorz and Mueller dates back to 1983, when they began three years of research that led them to report in 1986 that oxides have the potential to be superconductors at 35 degrees Kelvin (K) — significantly warmer than the previous record of 23 K at which a compound of niobium and germanium showed superconducting traits in 1973.

Researchers within IBM and other organizations have since found compositions, based on an yttrium barium copper oxide, that become superconducting above 90 K, which is well above the 77 K boiling point of liquid nitrogen.

IBM officials said other breakthroughs stemming from Bednorz and Mueller's work include IBM's development of a high-temperature, thin-film magnetic detector known as a superconducting quantum interference device, an industrial spraying technique for coating shapes with superconducting material and the discovery that superconducting materials can carry enough electricity to be useful for most foreseeable applications.

# "I'M TIRED OF SPOOLING AROUND"

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## EDITORIAL

# Seizing the reins

IT COULDN'T HAVE been put more poignantly, or with more flair, than the way David Chevalier made his point.

Standing in front of seminar audiences both at last month's Info '87 and last week's PC Expo, Chevalier, director of national account marketing for PC's Limited, asked his audience for a show of hands indicating those whose shops have a three- or five-year large system plan. Almost all nodded, almost all smiled, almost all raised a hand.

Then he asked the payoff question (he'd been setting them up): "How many of you have an end-user computing or micro implementation plan?" At Info, a lot of foot shuffling, but no hands; at PC Expo, one tentative wavering hand out of an audience of more than 100 — mostly MIS managers. Chevalier asked, Do you know that MIS will spend in excess of 50% more on acquiring micros than on mainframes this year? A few more nods now that he'd really gotten their attention.

All right, so nobody wants to inherit yet another planning responsibility, especially something as potentially complex and far-reaching as a personal computer implementaion blueprint. But the fact is this: The PC workstation will become the premier tool with which MIS executes its most vital and demanding role in the coming years, and that is the dispersal of information and information technology throughout the organization.

It is clear beyond the shadow of any reasonable doubt that the direction or control of PC planning and acquisition in Fortune 1,000 companies has been passed to MIS. As Glenn Miller, a veteran MIS professional and current director of strategic product planning at Businessland, said at PC Expo, the role of MIS in the PC acquisition process has "grown to primary control . . . due to the increasing risk-management issues."

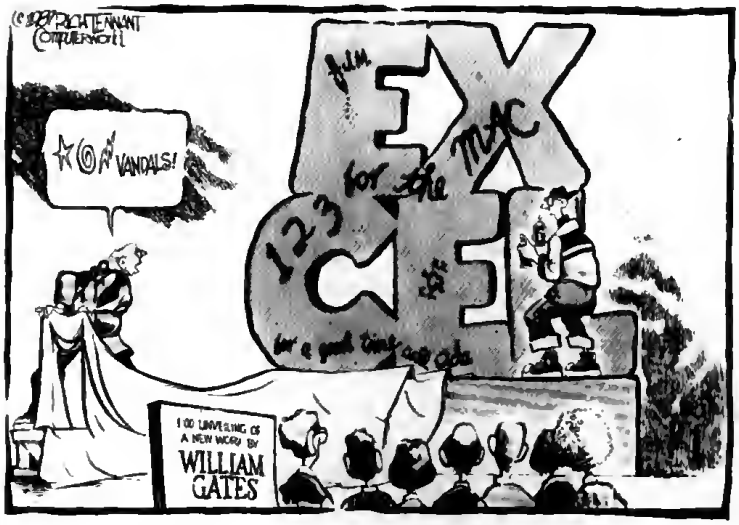
Further proof of the primacy of MIS in this process will be detailed in *Computerworld* next week, when we unveil the results of a far-reaching and comprehensive survey of PC acquisition patterns in Fortune 1,000-type firms.

So whether they were wanted or not, the PC horses are hitched to the MIS wagon. Now what is needed is a firm grip on the reins, and that means some sort of implementation plan.

In an increasing number of shops, MIS is getting closely, if not intimately, involved with detailed specification and quality control for significant PC buys — meaning either large volume or high-complexity buys. In Miller's words, this is best accomplished by balancing end-user requests with corporate directives from above.

Further, some key elements of large system planning processes can be incorporated into end-user plans.

Whatever planning tack is taken, a course should be set immediately. In about three years, there will be a one-to-one relationship between the number of white-collar workers in the U.S and the number of PCs installed. There should be a sense of urgency here.




## LETTERS TO THE EDITOR

### More for less

The article "Price cuts should up modem use" [CW, Aug. 24] on 9.6K bit/sec. dial-up modem prices did not point out that a number of significant products — including U.S. Robotics, Inc.'s Courier HST modem — are available for substantially less than the V.32 modems listed. V.32 modems appear to be getting more attention from the news media than from modem buyers, who are discovering they can get everything they need in a high-speed modem for less — much less.

*Mark Smith*
*Communications Director*
*U.S. Robotics, Inc.*
*Skokie, Ill.*

### Site licensing

The article "'Never Mind!' Businesses cool off on site license issue" [CW, Sept. 21] is not our view of the world.

United Software Security, Inc. has been site licensing its backup and security personal computer software products for three years and has more than 100 licenses to its credit as a result.

While site licensing should not be interpreted as an easy or short-term effort, it is very much alive among the more progressive and better organized corporations with substantial commitments to PCs.

We have found that companies willing and able to establish product standards have a consistent requirement for top-quality products.

In addition, the supplier commitment to product maintenance is an issue that is often researched. We are expected to be able to demonstrate our commitment to changing operating system and equipment environments as well as the addition of new features to meet evolving needs. As companies become more sophisticated in their thinking about PC software, this has become an increasingly substantial matter.

Site licensing involves a commitment from both the supplier and the buyer. It is not a matter that is entered into lightly by the buyer and this method of doing business should not be considered lightly by suppliers. Sales cycles range from three months to a year and a half and, as a result, require a level of tenacity that is more often seen in the mainframe software arena.

*Stephen M. Hicks*
*President*
*United Software Security, Inc.*
*Vienna, Va.*

### Pros and cons

Regarding the Spotlight section on the state of the data base management system world [CW, Aug. 10], I want to comment on James Bradley's comparison of Cullinet Software, Inc.'s IDMS/R and IBM's DB2.

Since the data base engine used by both systems is essentially a network structure, the main differences between the two would seem to be the degree of access to the network pointers allowed for the application programmer.

The IDMS/R pointers are accessible. The advantage is that selected access paths can be optimized to provide performance beyond that currently possible with DB2. The disadvantages are that data base tuning is almost an art form, requiring the work of highly paid specialists, and the physical data base will likely have to be restructured to optimize changes to the logical design.

DB2, on the other hand, has a more intelligent front end to the data base engine. The advantage of this is that the DBMS can make some of the tuning decisions that must be made by the data base designers under IDMS/R. The disadvantage is that those decisions will often not produce the performance that can be expected from a manually tuned IDMS/R system.

Cullinet is developing an SQL-based intelligent relational front end on the IDMS/R data base engine; IBM is working to increase DB2's performance. Assuming that both are successful, future differences between the two systems will be more in dictionary implementation, available development environments and fourth-generation language front ends, personal computer-to-mainframe linkages and vendor support than in which data base is the fastest or most flexible.

IDMS/R, however, has the added problem or opportunity of having to be backward-compatible. DB2 is a clean break from IBM's IMS, with a few bridges built between the systems but no real effort made to integrate.

The problem for Cullient is obvious, but the opportunity also becomes clear considering that the underlying structure of DB2 is a network. If IDMS/R's net-

*Continued on page 22*

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

# Treat consultants as valued partners

*Nurturing good consultant relations programs will prove to be a wise investment in the future*

EFREM MALLACH

Fact: No firm has the best product for all applications and all users under all circumstances.

Fact: Every firm has the best product for some application and some user under some circumstances.

Fact: Any firm can, within limits, make a product seem well suited for a specific application for a specific user under specific circumstances.

Fact: Sales agents have powerful incentives to do this.

Fact: Prospective computer buyers know the first four facts.

What does a bewildered buyer do? Generally, call in a consultant.

According to Schueler Communications, consultants helped select $57 billion worth of systems and software in 1986.

As soon as a consultant arrives, a vendor's chances depend partly on the merits of the product for the application and partly on how the consultant feels about the vendor.

**FOR THE consultant to survive, clients must stay satisfied with recommendations until they forget who made them.**

Why? Because selection advisers depend on client references (which includes obtaining follow-on work with the same client). For the consultant to survive, clients must stay satisfied with recommendations until they forget who made them.

So, consultants want to be sure about the following:

- The product. The client must not learn three months later that a different product would have done a better job. (This fact limits the tendency of some advisers to recommend "safe" vendors.)
- The supplier. Maintenance and training must be evaluated, along with other aspects of an ongoing business relationship.
- Resource availability. That the resources exist is not sufficient. Will they be available when needed? And does the consultant know how to access them?

Only the first of these assessments has a prayer of being objective. The others are evaluated as they are perceived. A vendor may be willing to demonstrate a product, but if the consultant does not know how to arrange a demonstration, it will appear that the vendor is not willing.

### A curable problem

For vendors to obtain consultant recommendations, they must get their message across to the consultants. Most vendors do a pitiful job in this department, but this problem is curable. For a start, vendors must recognize that positive consultant relations are based on two cornerstones:

- A commitment to follow-through. It takes at least six or eight exposures in the course of a year or so to make an impression. Start-and-stop efforts convey unreliability. There is nothing worse than a 3-year-old Consultants' Guide on a shelf as a reminder that a firm cannot finish what it starts.
- A partnership attitude with consultants. Some vendors treat consultants as adversaries, others as partners. Vendors who do not feel this partnership — and it cannot be faked successfully for long — should forget consultant relations programs until their attitude changes.

Once these attitudes are in place, a firm can begin to work with consultants effectively. The next step is to recognize that consultants are unlike any other public with which the firm deals. Consultants are not journalists, customers or resellers. However, consultants share some characteristics of each of these.

But they also retain their own unique characteristics. Consultants can claim a permanent sense of insecurity that can be eased by computer firms giving them information and making them feel important. This insecurity afflicts consultants much more than other people because they have no ongoing sense of product sales. Understanding characteristics such as this one is the key to reaching consultants effectively, and computer firms must understand them. So must the supporting cast of public relations firms, ad agencies and free-lance writers.

This understanding is a weak-

*Continued on page 22*

Mallach is a faculty member of the Boston College School of Management and a consultant to user and vendor executives. Based in Needham, Mass., he recently wrote and published *Win Them Over: A Survival Guide for Corporate Consultant Relations Programs.*

# Supercomputing's latest addition

*Commercially viable, the ETA[10] system should be a welcome commodity*

CHARLES P. LECHT

Supercomputer scientists tell us that the benefits to be gained through supercomputer development in all sectors of endeavor will so far outweigh the costs that no modern industrial power can live without them.

I cannot help but agree. So it was with no small amount of pleasure that in the summer of 1983, I was present at a supercomputer conference at Los Alamos National Laboratories in Los Alamos, N.M., and heard the announcement of the formation of ETA Systems, Inc., a subsidiary of Control Data Corp.

BILL RUSSELL

ETA would, according to its charter, "design, manufacture, market and support the fastest, most advanced supercomputers" available anywhere. CDC's chairman, William Norris, made the announcement to a group that included the heads of just about every major U.S. organization concerned with the country's defense and well-being.

### Outpacing the parents

In the following years, ETA has fulfilled its charter admirably. The ETA[10], delivered to Florida State University (FSU) in April of this year and recently ordered by a Japanese group, proves my point. Results reported by three eminent scientists at FSU's Supercomputer Computations Research Institute and one from CDC show the ETA[10] outpaces any system yet produced by ETA's parent company or Cray Research Corp.

Until ETA delivered the ETA[10], these two companies led the visible pack of supercomputer producers. ("Visible" because we can assume that the supercomputer work of some others never reaches the public's eye.)

Any measurement of the "absolute performance" of any computer system in millions of instructions per second, floating-point operations per second (FLOPS) or logical inferences per second is difficult at best, and the results are always controversial.

While measuring "relative performance" on a set of identical problems appears to yield more results, this method also has its problems. The hardware-software mix used cannot help but produce biased results, so we must be careful in evaluating the comparisons, especially those that are reported by the company whose product is deemed superior.

### Vaguely correct

But measure we must, doing the best we can with the facts we've got, this under the premise that a vaguely correct result is better than none at all. In performance comparisons of the same program set — one commonly addressed by the supercomputer community — the ETA[10] beat the pants off CDC's Cyber 205, a Cray-2 and a Cray X-MP Model 48 in almost every calculation offered to the four computer systems.

In the supercomputer business, the speed of computation for various classes of problems is what supercomputing is all about, so the ETA folks may have good cause to be happy. In one class, they managed to produce more than a billion FLOPS.

Just three short years ago, producing 100 MFLOPS was nary possible, so ETA's new system provides a quantum leap in performance.

The equipment ETA used to achieve the FSU results provides us with a definition of a dream supercomputer machine. It was composed of two ETA[10] CPUs, each with four 64-bit megawords (equivalent to 32M bytes) of static random-access memory (RAM). Both processors also shared additional memory of 64 megawords of dynamic RAM.

Apollo Computer, Inc. workstations provided the user interface for the processors, which are encased in liquid nitrogen-cooled cryogenic chambers. According to FSU, the system will be upgraded to four CPUs with 128 megawords of shared dynamic RAM this year. This enhancement should provide far greater still system performance.

### Fortran addicts

The software used in the comparison test was Fortran based, a fact that cannot help but amuse old computer users like myself. To think that after all of the years and all the hullabaloo about new language developments between 1957 (the year Fortran was introduced) and today, the pioneers at the forefront of technology are Fortran addicts.

Of course, we cannot be too surprised that the ETA system produced superior results; CDC is certainly no newcomer to the supercomputer market, especially at the high end. ETA's corporate leadership came from CDC. CDC's Cyber systems technology, along with Cray's, has, for a long time, been yielding the only readily available, commercially viable, "made-in-the-USA" high-end supercomputers.

There are other noteworthy systems offered by reliable U.S. companies, but these supercomputers have either not been around for a long time or are so costly that we would be hard pressed to label them as commercially viable. Of course, we cannot ignore IBM's contributions to the field, but these have been less visible than those of CDC and Cray.

The ETA[10] system, coming at a time when Cray is in the process of redirecting its efforts and several Japanese companies are quickly catching up to their U.S. counterparts, should be welcomed by the U.S. supercomputer community as quite timely indeed.

Lecht is an IDG News Service foreign correspondent, based in Tokyo.

## Consultants

CONTINUED FROM PAGE 21

ness of many well-intentioned consultant relations programs. Firms send consultants press releases, invite them to press conferences and prospect seminars. They spend huge sums in these attempts, and their efforts go for naught. Why? Because they don't understand or don't take into account the characteristics of their consultant audience.

To leverage sales successfully via consultants, firms must also define the particular types of consultants they want to reach and the specific characteristics of these types. This is in addition to the general characteristics of all, or almost all, consultants. Business-oriented advisers who specialize in hospital management systems do not respond to the same approaches as do technically oriented consultants who advise on scientifc benchmarks. Business-oriented consultants need product facts at a basic level and no sense of being talked down to; technical ones need "feeds and speeds" information, which they really lap up.

Only when these items are in place can a firm get the most from its consultant relations program. According to Schueler Communications, firms that establish a strong foundation for their programs will obtain more than their share of the $70 billion that consultants will influence in 1987 — or the even larger amounts consultants will sway in years to come.

*Continued from page 20*

work engine can also serve as the underlying structure for a relational DBMS, then Cullinet can do the following:

- Provide the engine as it is now, with accessible pointers, for people who have to have hot performance or backward compatibility with existing applications.
- Provide the same engine, buried under SQL and an artificial intelligence front-end.
- Build a dynamic link through the common data base engine between the two worlds.

DB2 cannot provide the same flexibility without doing the following:

- Implement a procedural language allowing manual pointer navigation to complement SQL.
- Develop a dictionary comparable to the one available with IDMS/R.

*James Robin Pasley*
*Senior Data Base Administrator*
*General Electric Mortgage Insurance Co.*
*Raleigh, N.C.*

## Beneath the layers

In a recent In Depth article, "When you're asked to cost-justify systems . . ." [CW, Aug. 3], the author, A. Perry Schwartz, referred to me as the "principal architect" of a "flawed" model he called TSTS (time-savings/times-salary).

Schwartz was only partially correct in this attribution. While at Booz, Allen & Hamilton, Inc., I was the principal architect of a technique for measuring white-collar productivity gains quantitatively.

However, his perception of a flawed model was itself flawed. Schwartz's criticisms were surprisingly similar to those expressed by Dean Meyer in his recent book, *The Information Edge*. Yet, to my knowledge, neither Meyer nor Schwartz ever had authorized access to the proprietary work we did at Booz Allen that ultimately served more than 50 clients.

Had they been suitably informed, they would have grasped that our work was underpinned by Jack Rockhart's well-proven "Critical Success Factor" (CSF) methodology. Accordingly, we told our clients how office systems could be used to reapply professional time misspent on less productive tasks to those activities directly linked to CSFs. Not only were we able to measure the potential reallocatable time but also to counsel how the business units could be reorganized and refocused to capitalize on the improvements.

In that respect, I concur strongly with the direction Schwartz and Meyer are pursuing. We charted that direction as early as 1979. For those who wish to understand what we really did, the highlights, as well as recent refinements, are described in *Information Technology: The Trillion-Dollar Opportunity.*

*Harvey L. Poppel*
*Partner*
*Broadview Associates*
*Fort Lee, N.J.*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## This week in history

**Oct. 17, 1977**
Industry associations are lending their weight to a proposal by the National Commission on New Technological Uses of Copyrighted Work that copyright protection be given to computer programs. But the Computer and Business Equipment Manufacturers Association and the Information Industry Association stress the need for a tighter definition of the term "computer program," which does not currently afford adequate protection to subroutines or program modules.

**Oct. 18, 1982**
The Department of Defense will begin testing a "smart card," a device the size of a credit card that contains an embedded microprocessor and which will be issued to some 2,000 army personnel to gain admittance to base hospitals and commissaries.

IBM

# Who says you have to pay extra to get an ASCII terminal equipped with these three letters?

**Introducing the new family of IBM 3151 ASCII displays.**

Now you can have the most versatile ASCII terminals IBM has ever made, for the lowest price IBM has ever offered. Our new 3151 family gives you more functions, and greater compatibility with more ASCII host system computers, for single unit purchase prices starting at less than $400* per terminal.

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The entry level Model 110 comes with 10 non-IBM emulations built in, and provides an 84-key keyboard with 12 definable function keys.

The full-function Models 310 and 410 come with 11 emulations, and are easily capable of more (such as DEC VT220/100/52™ and WYSE WY-50/50+™) by simply adding a new low-cost, slimline cartridge. Their 102-key keyboards, equipped with up to 36 definable function keys, are also recappable, so you can adapt them to fit just about any program.

**We worked harder to make them easier to use.**

Besides being designed for compatibility with other computers, IBM's new ASCII terminals are more compatible with people. New 14" flat screen displays provide a non-glare viewing surface and smooth scrolling. Our 310 and 410 models also offer a choice of 80 or 132 column displays, with crisp character resolution, in green or amber-gold.

What's more, we built the logic into the monitors, making all three models more compact and more reliable.

However, the most important feature of our new displays isn't on the screen, but above it: the IBM name. IBM provides not only a choice of a one or three year warranty, but a tradition of quality, service and support.

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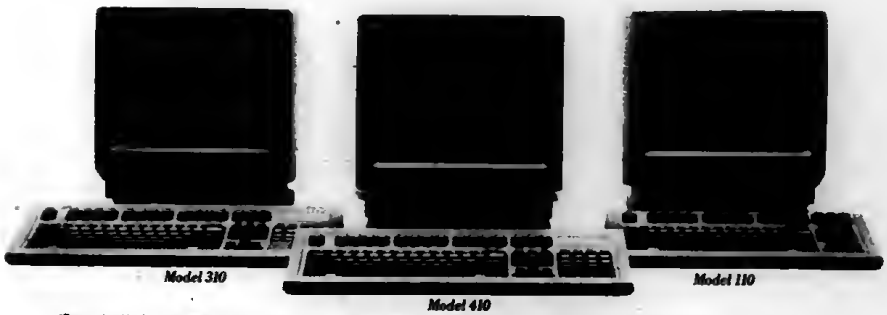

*Model 310* *Model 410* *Model 110*

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When you think about it, relational DBMS products have a lot in common. They're all built around SQL. Most include 4GL tools. They all have a list of features and functions you can check off one at a time. And they all claim high performance.

But once you really get to know relational DBMS products, the differences between them become as clear as the differences between a great wine and a lesser vintage. It's the care in blending quality ingredients that produces a really great product.

And that's why INGRES is now establishing itself as today's DBMS standard.

INGRES runs on everything from mainframes to minis to workstations and PCs. And our new INGRES/STAR, the first distributed DBMS, lets users work with data from all your corporate databases and systems. Anywhere in the world. As a result, just like any vintage product, we're recognized by leading experts in the field. INGRES has been voted "Best DBMS/4GL" by *Digital Review* for two years running.

We have also delivered such a consistently high level of customer satisfaction that 99% of our customers stay with us, year after year.

Here's what it all comes down to: You can't tell a great wine from an ordinary one just by reading the label. And you can't really get to know a DBMS just from a data sheet. That's why we'd like you to experience INGRES first-hand.

Just send in this coupon, or call us. And get a taste of what a superior relational DBMS can do.

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# SOFTWARE & SERVICES

SOFT TALK

*Charles Babcock*

## How to make IBM listen

Jay Goldberg, the chairman of ADAPSO, has attacked IBM's 4-year-old policy of restricting access to its operating system source code in a speech that presages a toughened stance by his organization [CW, Oct. 5].

ADAPSO is about to issue a position paper that will push the group's stand beyond the fruitless negotiations in which it has been engaged with IBM. Although the antitrust suit by the U.S. Department of Justice was dropped, the European Economic Community's case against IBM was only suspended with notice at the time that the source code issue had not been resolved. For starters, the ADAPSO strategists believe they will get a sympathetic hearing there and then move on to build a case with U.S. government agencies.

Although Goldberg threatened litigation during his speech to ADAPSO members in Colorado Springs, his words fall under the heading of saber rattling. The graybeards of the group, veterans of many previous battles, see pressure points like the Common Market as of-

*Continued on page 31*

# On-line systems mushrooming

***Study: Heated quest for current information furthers system reliance***

BY CHARLES BABCOCK
CW STAFF

BOSTON — As businesses seek to compete with more up-to-date information, they are driving the computer industry toward greater and greater reliance on on-line transaction processing (OLTP). That was the conclusion of a recent report by The Yankee Group titled, "The Future of Transaction Processing."

Manufacturers, retailers, financial institutions and inventory managers in all types of companies are among those furthering the need for more on-line systems.

The market for hardware and software for transaction processing is estimated at $17 billion this year and is projected to grow 17% per year during the next five years.

**Tricky trade-offs**

On-line systems, however, are more complex to engineer than batch systems. They typically involve shared access to a common data base. For that data base to provide up-to-date information, it must be able to handle simultaneous updates while preserving data integrity.

"Trade-offs are typically required between operating characteristics. Increasing performance means less data integrity. . . . High availability requires additional hardware and sophisticated data integrity [features]," the report said.

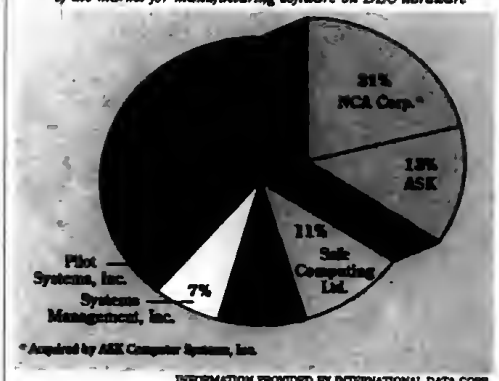
IBM clearly dominates the mainframe side of OLTP with what The Yankee Group study called "several conflicting products," including the IMS file management system, the CICS terminal network teleprocessing monitor and the Transaction Processing Facility (TPF) for specialized transaction processing applications, such as air-

*Continued on page 31*

## Data View

**Stacked deck**

***ASK's acquisition of NCA resulted in a greater than one-third share of the market for manufacturing software on DEC hardware***




INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

# Unix gets CICS link

BY SUZANNE WEIXEL
CW STAFF

EMERYVILLE, Calif. — Unisoft Corp. recently announced Unitecs, an IBM CICS emulation package for computer systems running the Unix operating system.

Unitecs is said to provide Unix-based systems with IBM compatibility as well as with emulation of the major features of CICS.

According to John G. Lax, the director of Unisoft's Commercial Systems Division, there are

*Continued on page 33*

# Tool turns diagrams into code

BY CHARLES BABCOCK
CW STAFF

WALTHAM, Mass. — A computer-aided software engineering (CASE) tool that generates applications for the Digital Equipment Corp. VAX from a design and diagramming tool on an IBM Personal Computer AT has been announced by Cortex Corp.

The CASE product, Corvision, is one of the first to tightly link a design and diagramming front end to an application generator. The generator, however, produces applications in a Cortex proprietary language called Builder code.

Cortex officials said the proprietary code should not matter because applications can be modified using the front-end specification and diagramming process. Some users, however, are likely to ask how they will get precisely the applications they want without a trained stable of Builder programmers.

*Continued on page 29*

**Inside**


- Interface Software announces relational DBMS upgrade for engineers. Page 30.
- Computer Information Systems adds micro I/O switches to resource manager. Page 33.



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# Interbase upgrades DBMS for DEC, Sun environments

TYNGSBORO, Mass. — Interbase Software Corp. earlier this month introduced an upgraded version of its relational data base management aystem for Digital Equipment Corp. minicomputers and for workstations from Apollo Computer, Inc. and Sun Microsystems, Inc.

The small company, which has built a customer base of 40 users since the product'a introduction last year, is taking aim at a highly competitive market.

The firm said it plans to target the system, which is also called Interbase, at engineering and other compute-intensive markets.

The new release was revamped to appeal to end users, according to Ann Harrison, design engineer.

For example, Version 2 has a utility to create screens for data entry, updates and retrieval. A standard-screen format is provided for users who do not wish to create their own.

The previous version of Interbase, which was targeted at sophisticated application developers and OEMs, displayed data in table formats and entries were made in a command-line format, Harrison said.

The system was designed for work group environments in which large volumes of data are shared among users. The company has incorporated some features of a distributed relational DBMS for that purpose.

Users on different workstations can access and update data residing on a different CPU, Interbase claimed.

However, the system does not support a global data dictionary, a key requirement for a distributed system, industry observers said.

The software supports the IBM DB2 version of SQL while also using proprietary technology, such as its own data manipulation language, according to the vendor.

Interbase also supports industry-standard communications protocols, such as Transmission Control Protocol/Internet Protocol and DEC'a Decnet.

The program will run under both DEC'a VMS operating system and Ultrix, a Unix operating system, as well as Apollo'a and Sun'a own versions of Unix.

### Finding a niche

"We're not aiming at traditional markets," said Lawrence Wiensaczak, director of marketing for Interbase. "There'a too much competition there. So we have to establish ourselves someplace else."

The system is scheduled to be generally available at the end of this month.

Licenses range in price from $5,000 to $75,000, depending on the size of the hardware.

# Diagrams

CONTINUED FROM PAGE 25

The application generator is known as the Application Factory, an established Cortex product on the VAX. Most application generators produce about 80% of the application desired.

### Factory boosts production

Cortex President Craig Hill said the Application Factory, when tied to the personal computer-based front end, will produce 95% to 98% of an application. Program developers can finish the application in Builder code or any native VAX third-generation language, he said.

Applications built with Corvision use DEC'a Record Management System and relational data base management system, RDB, Hill said.

Corvision uses a technique called picture programming, which uses a set of diagramming symbols to define data types, relationships, menus, screens and reports.

A central repository on the VAX stores all design information and enforces consistent use of design symbols, Cortex officials said.

A guidance system in the repository prompts the developer on the next logical step in the development process.

Du Pont Co. uses Corvision and the Application Factory in a rapid prototyping process that company spokesmen said increases end-user involvement and speeds the development process.

Since April, Du Pont has been an investor in Cortex, a privately held company.

Du Pont recently formed a subsidiary, Information Engineering Associates, to build custom VAX applications using the Cortex products.

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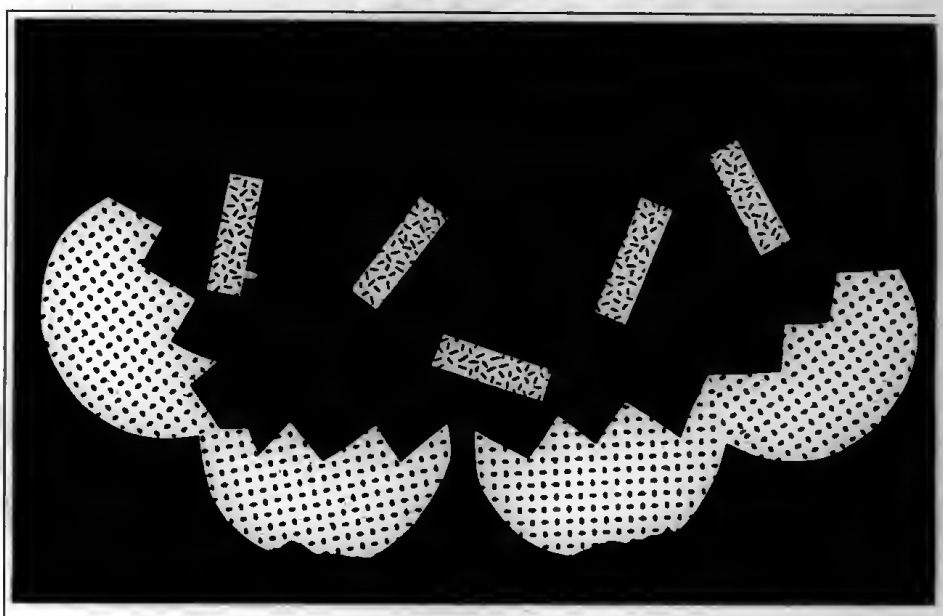

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# Make IBM listen

CONTINUED FROM PAGE 25

fering the greatest opportunity for making IBM listen.

Goldberg also cited the recent IBM arbitration agreement with Fujitsu that gave the Japanese firm access to IBM source code — at a price. "It is unthinkable that Japanese software developers be given access to IBM operating system source code while American companies . . . are excluded," he said.

This was a jab at IBM that probably sent a stable of lawyers in Armonk to write briefs. The arbitration agreement set no legal precedent, and few ADAPSO members are confused on that point.

What is at issue here is the ability of independent software companies to build complementary products for environments supplied by IBM operating systems. IBM will say it isn't necessary to release source code because the company publishes interfaces that allow software developers to tie products to the operating systems and the related subsystems.

The interface option is a limited and would eliminate many products now available if developers are restricted to using the hooks in the base system, according to Marty Goetz, chairman of ADAPSO's IBM interface committee.

Performance monitors, for example, cannot do their job when held at arm's length from the operating system by an interface. Stan Rintel of Sylogy in Teaneck, N.J., has told ADAPSO members that he could not have developed a compiler to track changes in an IBM Cobol program and only recompile the changed lines, a time-saving innovation, if he hadn't had access to the source code. When IBM announced VS Cobol II, it declined to reveal the source code; thus, Rintel said, he cannot write a similar product for the latest stripe of Cobol.

If IBM wishes to claim proprietary source code, it seems logical for ADAPSO members to insistently note that IBM holds a near monopoly on operating systems, a condition that dates back to the time when the company gave away the operating system with the hardware. This continued for 10 years after IBM "unbundled," Goetz noted. By the time it stopped, IBM operating systems were entrenched with thousands of applications written for them.

The underlying rationale for the American Arbitration Association agreement was that customers of both companies were best served by a period of predictable compatibility, with Fujitsu making an aboveboard payment for the privilege. A stronger rationale would apply for customers of U.S. companies to have the right to know their vendors have a competitive chance to keep up. If IBM denies them that, we must ask how so much power came to be concentrated in one company in the first place.

Babcock is *Computerworld's* senior editor, software & services.

# On-line systems

CONTINUED FROM PAGE 25

line reservations.

In the minicomputer field, competition is heating up between Digital Equipment Corp. and the minicomputer makers that have specialized in transaction processing, particularly Stratus Computer, Inc. and Tandem Computers, Inc.

New 32-bit workstations like DEC's Vaxstation 2000, IBM's Personal System/2 and Sun Microsystems, Inc.'s Sun-3 have the potential to perform as transaction processors, and software to harness them is "less than a year away," according to the report.

### Coping with trade-offs

But software suppliers at all three levels are struggling to deal with the trade-offs involved.

The OLTP systems of the large airlines push 1,500 transaction/sec. through their reservations systems, while most systems are geared toward the 1 to 10 transaction/sec. rate more typical of applications today.

The Yankee Group said it expects the next generation of IBM mainframes to double the 200 transaction/sec. rate that is typical of an IBM 3090 Model 200 running TPF.

With software geared to four to eight parallel processors, "it is likely that 3,000 transaction/sec. can be achieved by 1991," the report stated.

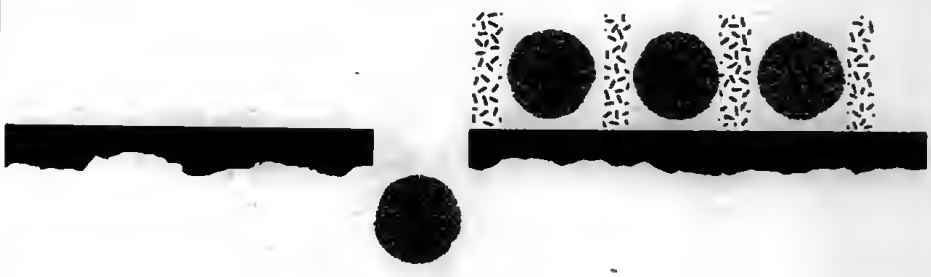
### Unix false hope for newcomers

A number of start-up vendors have chosen Unix as a way into the market, citing Unix's portability feature. But Unix lacks OLTP foundations, as was discovered by Auragen Systems Corp., Synapse Computer Corp. and Enmasse Computer Corp., start-up companies that died while trying to enter the market, the report noted.

Tandem, with its Nonstop SQL, offers a VLX system capable of the mainframe-like 200 transaction/sec. rate, the report noted.

DEC has the most to gain or lose in the transaction processing field. Its VAX system meets the needs of many users today, but the report describes the firm's hardware and software as "offering mediocre on-line transaction processing functionality" and needing to be replaced by new products during the next three years.

"If not, Digital's strategy of attacking rapidly growing commercial markets like financial services could falter," the report said.

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# CICS link

CONTINUED FROM PAGE 25

three areas in which the company expects Unitecs to be most beneficial. They include developing and maintaining CICS Cobol applications on a mainframe in a Unix environment, moving existing CICS Cobol applications from mainframes to Unix systems and developing transaction-processing applications on Unix systems using the available pool of Cobol/CICS programmers.

"In overloaded departmental computing environments," Lax said, "Unitecs allows CICS applications to be developed on Unix systems, and it produces code that can be moved onto a mainframe for system test and real-time multitasking use."

Unitecs is said to provide full CICS emulation for applications that are written in Cobol. It also reportedly uses command-level CICS, DOS or MVS to Release 1.6 and 1.7 standards of CICS, processes VSAM/DL1 files and handles IBM 3270-type display terminals through Minimum Function Basic Mapping System.

The major components of the Unitecs environment include a Cobol runtime system from Micro Focus, Inc.'s Micro Focus ET or VS Cobol compiler with extensions to accept calls to Unitecs functions; Cobol application programs written with embedded commands that are passed to the Unitecs Run-Time; and the Unitecs Run-Time, which includes additional run-time routines that intercept I/O requests from application programs and pass them to the relevant system processes.

Also included are a screen handler, a file-handling system, system control and development tools.

Additionally, Unitecs provides access to such Unix development tools as Shell scripts, file-comparison programs and Make facilities.

Unitecs' memory size, processor speed and disk capacity are determined by the requirements of the installation.

Pricing is set in relation to the size of the processor. For a sample configuration in which the processor, disk and memory cost less than $20,000, a Unitecs development environment is priced at $8,000.

End-user versions will be available next month for Sequent Computer Systems, Inc.'s Balance, NCR Corp.'s Tower 600, Hewlett-Packard Co.'s Precision Architecture systems running HP/UX and the IBM 6150, the vendor said.

> "IN OVERLOADED departmental computing environments, Unitecs allows CICS applications to be developed on Unix systems, and it produces code that can be moved onto a mainframe for system test and real-time multitasking use."
>
> JOHN G. LAX
> UNISOFT CORP.

# Quantum RS manager tool adds macro I/O

BRAINTREE, Mass. — Computer Information Systems, Inc. recently enhanced its Quantum RS resource management software for Digital Equipment Corp. VAX/VMS systems to incorporate macro I/O routines.

Because the new I/O routines interface directly with DEC's VAX Record Management Services, Quantum RS Version 4.2 operates up to 45% faster than the previous release, company spokesmen said.

The product features the ability to collect resource usage information automatically or interactively at user-specified times. It accounts for resources used more than a maximum of six shifts, allowing an account of a user session that spans several shifts. It also accounts for resource usage across oodes and clusters.

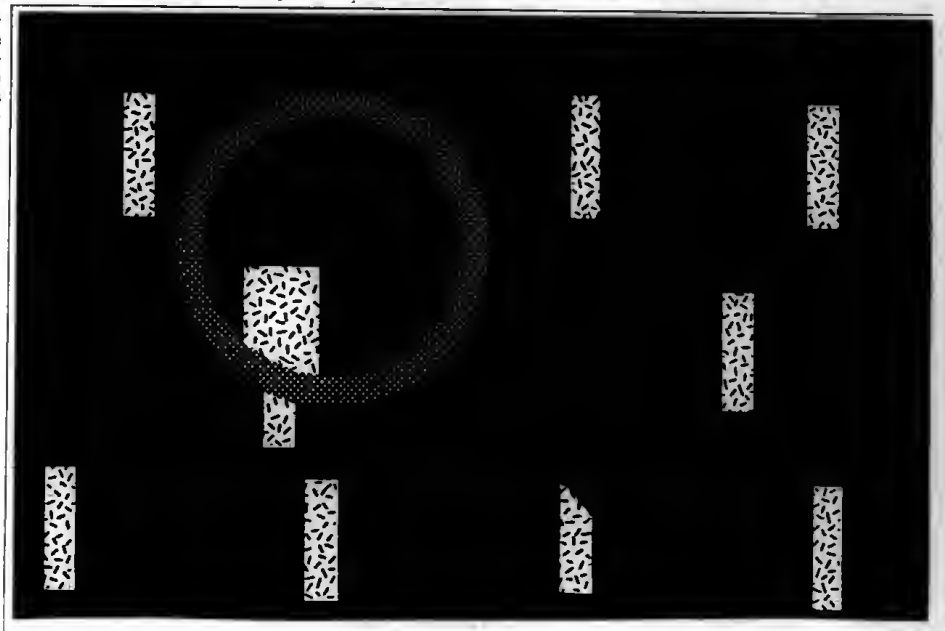
Twelve reports providing more than 35 performance and statistical measures are available, according to the vendor. Thirty resource and sales figures are available as well.

Additional enhancements include redesigned project accounting programs said to offer increased flexibility and to require less overhead. Users can call their own project verification routines supplied with the software.

A simplified product installation procedure that uses the VMSINSTAL utility has also been added. In an attempt to simplify user management and data management functions, macro commands that facilitate setup, adjustment and deletion of multiple items are included.

Available now, Quantum RS Version 4.2 operates on DEC Vaxclusters, VAX networks and single CPU environments on all versions of VMS 4.0 and later.

Licenses for the first CPU are priced from $2,500 for the DEC Microvax II to $12,000 for the VAX 8800 series.

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# NEW PRODUCTS

## Systems software

**Global Scan/Replace Source**, a software product designed for use on the IBM System/38, has been announced by **Golden West Software**.

The program is said to allow users to scan source files for character strings and automatically change each occurrence of the string with a different character string. Additionally, the user can automatically recreate objects after the source has been changed.

Global Scan/Replace Source can search and replace any string of up to 40 characters. It supports numbers as well as uppercase, lowercase and wild-card characters.

With source, the program costs $725. Without source, it costs $475.

Golden West Software, 11442 Gettysburg, Norwalk, Calif. 90650. 714-850-6241.

## Applications packages

**Mass-11 Calendar Management**, a time management package designed for Digital Equipment Corp. VAX systems and IBM Personal Computers, has been announced by **Microsystems Engineering Corp.**

Users can automatically block time for meetings and appointments and label appointments according to priority. Continuous reminders about upcoming events can be set up, past calendar information can be archived and a list of all meetings relating to a particular subject can be compiled.

Pricing is $5,750 for VAX computers 8500 and larger; $2,875 for VAXs between 11/780 and 8300; and $1,850 for the Microvax II, 11/730 and 11/750. Software for the Vaxstation 2000 costs $995. The PC version costs $195.

Microsystems Engineering, Suite 400, 2400 W. Hassell Road, Hoffman Estates, Ill. 60195. 312-882-0111.

## Utilities

**Help/Key**, a product said to provide Help facilities to CICS users, has been announced by **Main Frame Software Products, Corp.**

Help/Key enables users to create and maintain on-line documentation and Help messages for on-line applications. Users can incorporate such facilities as Help windows and field-level Helps. Help screens can be created interactively directly from the transaction screen utilizing the facilities of IBM 3270-type terminals.

Help/Key uses standard command-level CICS and is compatible with all current releases of CICS running under the VSE and MVS operating systems. License fees range from $7,900 to $9,900.

Main Frame Software Products, 135 Glen Road, Wellesley, Mass. 02181. 617-239-0288.

## Data base management systems

A relational data base management system for Unisys Corp.'s Sperry 1100 mainframe has been announced by **Amperif Corp.**

The system, called the **Amperif RDM/2**, is an integrated hardware/software solution said to use special-purpose controllers to interface with the host mainframe. It features support for SQL as well as Amperif's own relational query language. Data base management functions are off-loaded from the host, and shared access to common data bases is provided for up to four mainframes.

Depending on configuration and amount of storage capacity, the RDM/2 is priced from $240,000 for a 1.3G-byte configuration to $520,000 for an 11G-byte configuration.

Amperif, 9232 Eton Ave., Chatsworth, Calif. 91311. 818-998-7066.

## Training software

**Advanced Systems, Inc.** has added a course called **Technology Perspective: IMS/VS Version 2 — Is It Right For You?** to its Technology Perspective series of training programs.

The video-assisted course was designed to introduce the major components of IBM's IMS/VS Version 2. Viewers are said to learn to recognize the basic components of IMS/VS Version 2.

The course is 30 minutes long and may be rented for $50 to $150 per month, depending on rental volume.

Advanced Systems, 15 E. Algonquin Road, Arlington Heights, Ill. 60005. 312-981-1500.

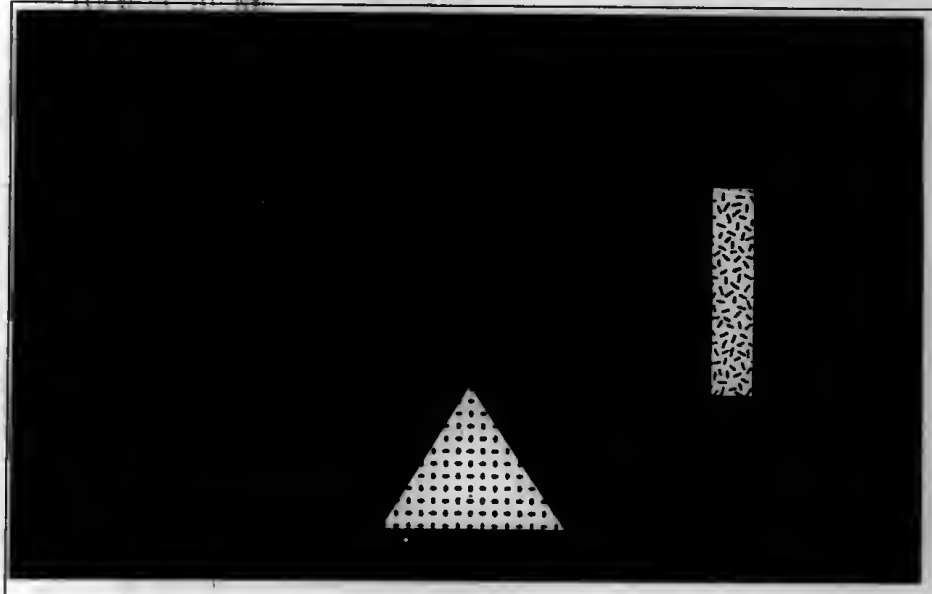
## Development tools

**Signal Technology, Inc.** has announced **Version 5.1** of the **Smartstar 4GL** application development system.

Enhancements include a fourth-generation language facility for creating scrolling regions using only keypad commands; scrolling features allowing for viewing and management of multiple data items on the screen; and fourth-generation language support to data movement functions, including movement across different data base file structures.

Smartstar is priced from $7,000 to $55,000.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117. 805-253-5787.

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The fast world of transaction processing has a new speed limit. Because Sequoia has just introduced the Series 200: a fault tolerant system that delivers faster performance at a far lower cost per transaction. In fact, as these audited test results prove, Sequoia dramatically outperforms both Tandem* and Stratus.*

**TRANSACTION BENCHMARK RESULTS**[1]

| | SPECS. | Trans. Per Sec. | Cost/Transaction[4] |
|---|---|---|---|
| **SEQUOIA[2] SERIES 200** | **6 Processors** | **83** | **$11,200** |
| TANDEM[3] VLX | 4 Processors | 26 | $38,200 |
| STRATUS XA2000 | 4 Processors | 50* | $16,600 |

*Results produced without transaction protected files.
[1] Based on standardized ETI Benchmark. Results published by FT Systems Newsletter 1987 ITOM Inter Co. [2] Audited results published 10/12/87 [3] Using NonStop SQL.™ [4] Prices for systems: Sequoia $929,000; Tandem $995,000; Stratus $830,000.

And with Sequoia, you finally have the capability to add pure power as you add processors, with no degradation.

## ARCHITECTURE THAT MEANS HASTE WITHOUT WASTE.

Sequoia's elegant, tightly coupled architecture is a significant new step in the evolution of fault tolerant transaction processing.

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And with the Sequoia Series 200, you can expand your system piece-by-piece, adding processing, memory or I/O modules in any configuration you want. A remarkably cost-effective way to grow as large as you want at your own pace.

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Instead of using a software approach, which by nature is complicated, costly, and inefficient, we built fault tolerance into our hardware. But, unlike systems that require *double* the hardware, with a backup for every primary processor, we have a much more effective solution: "PLUS 1."

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Marlborough, MA 01752

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SEQUOIA

MICRO BITS

*Douglas Barney*

## Data be the day

**Disk Error.** When Microsoft announced Excel for the IBM PC recently, the firm provided preview copies of the software for the press and analysts to load at their leisure. However, two of the disks were mislabeled, causing problems during the installation procedure. Fortunately, our crack staff of PC-literate editorialists quickly discovered the problem and was soon recalcing away.

**Manzi at bat?** The long development time of Excel for the PC gava Microsoft plenty of time to develop unique advertising ideas. One scheme that was dumped had a forlorn batter about to walk back to the dugout, with a banner headline that read, "1-2-3, You're Out!" The advertisement might have been designed to rankle Lotus Chief Executive Officer Jim Manzi, an avid baseball fan. But the ad was "a little too harsh," as someone at Microsoft put it.

**A benchmark-clearing brawl.** Microsoft's claims that Excel for the PC outperforms 1-2-3 may not sit well with some

*Continued on page 46*

# Concurrent DOS 386 fired up

*Update runs multiple MS-DOS sessions on several serial terminals*

BY ALAN J. RYAN
CW STAFF

MONTEREY, Calif. — Digital Research, Inc. last week enhanced its Concurrent DOS 386 by announcing Release 2.0. The latest version, reportedly fully compatible with Microsoft Corp.'s MS-DOS 3.3, offers users tha ability to run multiple MS-DOS sessions concurrently on multiple serial terminals.

With the increased functionality of the operating system, a user can run multiple and concurrent MS-DOS simultaneously on the main console and up to two MS-DOS programs or concurrent programs on whatever serial terminals are attached, according to Dick Williams, president of Digital Research.

Slated for availability next month, the $495 operating system is said to support IBM PC-DOS and MS-DOS Releases 1, 2 and 3 on all consoles. Applications that run on the latest version include Ashton-Tate's Dbase III Plus, Lotus Development Corp.'a 1-2-3, Computer Associates International, Inc.'s Supercalc, Microrim, Inc.'s R:Base System V and Wordperfect from Wordperfect Corp.

Concurrent DOS 386 supports "terminate and stay-resident" programs such as Borland International's desktop utility program, Sidekick. Users can reportedly run up to 255 tasks simultaneously, a feature that provides growth capability as the user goes to faster and faster processors, Williams said.

Concurrent DOS 386 is also said to support local-area network (LAN) versions of applications such as Dbase III Plus and Supercalc4 without the need for network hardware, which re-

*Continued on page 40*

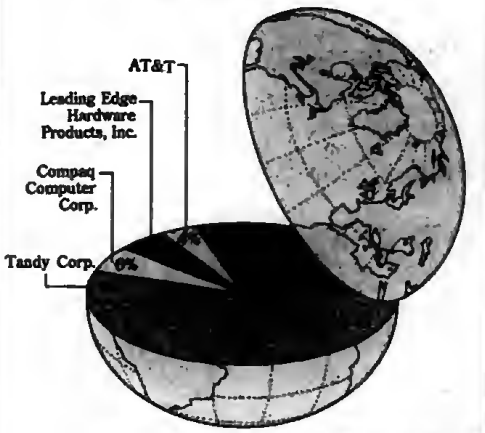
**Inside**


- Profile: Compaq's Gary Stimac discusses his firm and the PS/2. Page 39.
- Users applaud Apple's Hypercard. Page 39.
- Softcraft programs provide Wordperfect users with desktop publishing ability. Page 47.


## Data View

PC shipments

*Share of worldwide market*




INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART: AMY J. SWANSON

# Excel groundwork bears third-party product fruit

NEW YORK — Prior to the recent announcement of an IBM Personal Computer version of its Excel, Microsoft Corp. worked closely with a number of third parties to develop products that extend Excel's capability.

The result is an impressive array of products, most of which center around connectivity between systems and take advantage of Dynamic Data Exchange, a Microsoft Windows facility for data sharing.

Micro Tempus, Inc. enhanced its Tempus-Access data link to let Microsoft Windows users import data from IBM mainframe computers without leaving the Windows environment. The upgrade reportedly will be available free of charge to Tempus-Access users in December.

DB/Access, Inc. demonstrated View/PC, which allows Excel users to import host data independent of the particular minicomputer or mainframe link.

Access Technology, Inc., maker of the 20/20 spreadsheet that runs on mainframes, minicomputers and micros, announced a facility by which 20/20 users on Digital Equipment Corp. VAX minicomputers and users of Excel can use the same models.

The firm also announced that it will enhance Excel for Apple Computer, Inc.'s Macintosh with two upgrades next year.

However, Microsoft still has a long way to go to catch up with the numerous add-on products that work with Lotus Development Corp.'a 1-2-3.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Data Center photograph courtesy of Genix Corp.

SMALL TALK

*William Zachmann*

# Time-sharing in spotlight

Generally, the copies that I receive of *Online Today*, the magazine sent to all Compuserve, Inc. subscribers, get only a cursory reading. But the inclusion of Compuserve's "Fingershopping Catalog" in the October issue nailed me with admirable direct-mail efficiency.

While I've long used Compuserve, primarily to check the Official Airline Guide flight listings when planning my travel agenda, I've never had a proper manual for the service. So I decided to order some of the books on using Compuserve advertised in the magazine.

These included the *Compuserve Information Service Users Guide*, the *Compuserve Almanac* and *Advanced Compuserve for IBM PC Power Users*, by Charles Bowen and David Peyton. I ordered them on-line and, within a few days, found them in my post office box.

I thought I had a pretty good idea of the services that were available, having used Compuserve for some time. The menu system and various ways to get help on-line had given me what I thought was a pretty good acquaintance with the service. Just flipping through these three books, however, quickly showed me how much I'd been missing.

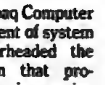
If you are an experienced user of Compuserve, you probably know more about it than I do. But if you have never used Compuserve, let me assure

*Continued on page 43*

# Compaq's Stimac aims to protect MIS investment in PCs, calls bus wars a passive issue

Gary Stimac, Compaq Computer Corp.'s vice-president of system engineering, spearheaded the development team that produced Compaq's impressive Deskpro 386/20 series, which was introduced last month. Being a consummate team player, however, he downplays his role in the project.

"We don't have people that work for anyone. We have people that work with each other. We are a very team-oriented company," he says.



Stimac has been with Compaq from the start; he was the company's fifth employee. While there, Stimac has worked closely with Microsoft Corp. on versions of its MS-DOS and Basic for Compaq systems. In 1985, Stimac pulled together the engineering team that developed the Deskpro 286 and eventually the groundbreaking Deskpro 386.

Before joining Compaq, Stimac spent nine years with Texas

**Gary Stimac** *compares IBM, Compaq architectures*

Instruments, Inc., where he was involved in system development using Intel Corp. 8088 and Z80 technologies.

Stimac spoke with *Computerworld* Senior Editor Ed Scannell at the Deskpro 386/20's introduction in New York about a range of technological issues, most of which centered around the differences between Compaq and IBM hardware architectures.

**What kind of engineering job did IBM do with the Personal System/2?**

I think it is a reasonable engineering job. I think there are some esoteric benefits to the Micro Channel architecture, but do those benefits really deliver end-user benefits? Or is that the only way to deliver end-user benefits? The answer is no. There are other ways to deliver benefits, and that is why I would like to get out of the bus wars.

**With IBM having announced its Micro Channel, what is Compaq's selling point to large corporate accounts these days?**

We protect the MIS investment in PCs and software today. And we can advance the performance of what we are delivering by providing more throughput. Compaq's purpose is to not get into bus wars with respect to IBM. We feel the underlying architecture, be it Micro Channel or the Flex architecture that we have introduced, is a passive issue.

The actual architecture itself does not contribute to the overall performance of the system. There are different active components within the system — like the CPU, the memory, the disk subsystem, the different coprocessors. As long as that architecture does not limit the active components of the system, then those are the things that can contribute to the performance of the system.

**From an engineering standpoint, what advantage does the Deskpro 386/20 have over IBM's PS/2 Model 80?**

The most important part of all CPU systems is to keep the CPU busy. About 90% of all operations are CPU- or memory-type

*Continued on page 46*

# Corporate users give Hypercard thumbs-up

BY JULIE PITTA
CW STAFF

Just a month after its initial shipment, Apple Computer, Inc.'s Hypercard has found a mostly receptive audience with corporate users.

"It's a very addictive product," said Rick Richardson, national director of technology development for Arthur Young. "Once you get started with it, three hours go by in a flash."

Richardson said he recently used Hypercard as a presentation tool during a technology conference led by his department for other Arthur Young staffers. The program presented a general outline on the main "stack." Richardson said he "clicked buttons" corresponding to specific portions of the outline to present more detailed information on those topics. A projection device for the Apple Macintosh let him show the information on a large screen.

When the conference adjourned, attendees received stacks for future reference.

Hypercard is also finding a home in financial applications. Jim Hayes, microcomputer manager for Seafirst Corp., a Seattle-based Bankamerica Corp. subsidiary, said his company is

**Hypercard**

*Price: $49 for a currently owned Macintosh. Free with any Mac purchased since September.*

- 1M byte of RAM
- Two 800K-byte floppy disk drives — hard disk is recommended for maximum performance
- Three disks and one backup
- On-line "help stack"

experimenting with Hypercard as a means of presenting financial reports to upper management.

Again, a general report would appear on the main stack. To receive more detail, a user would target a line, click a button and receive more detailed data regarding that particular item.

Hypercard's 1M-byte random-access memory (RAM) requirement could prove an obstacle to Seafirst's implementation of the product. The firm currently owns only two Macintoshes with Hypercard; about 99% of Seafirst's Macintoshes have only 512K bytes of RAM.

"We'll use it in isolated situations, not widely," Hayes said. "It'll probably be something we will use in the long run as we replace older machines with it."

*Continued on page 40*

# Accounting package makes sense for some

*Users at small firms say Dac-Easy's price, ease of use appealing*

BY ALAN J. RYAN
CW STAFF

DALLAS — After reading an advertisement for a low-priced accounting software package two years ago, Chris Corpuz figured it would be worth a small investment to see how well it worked.

Corpuz, a manager at Deloitte Haskins & Sells in Costa Mesa, Calif., said he has recommended the Dac-Easy Accounting package to at least a dozen of his clients since then.

Admittedly, the $99.95 Dac Version 2.0 from Dac Software, Inc. is not for everyone. It was designed for smaller companies, and some larger firms that have tried it have recorded unfavorable results.

One customer, who works in packaging in a $500 million company, said he looked at Dac-Easy Accounting for off-line tracking of various accounting elements but found problems with the capacity.

"For us, it was something to play with and do a little tracking on, but not to track our whole accounting system," he said.

But according to Corpuz, "If a personal computer can fulfill your accounting needs, then there is a great likelihood that Dac can meet your needs."

The package comes with seven integrated modules: general ledger, accounts payable, accounts receivable, inventory, billing, purchase order and forecasting. For additional functionality, like job costing, Dac offers a separate payroll program, Dac-Easy Payroll, which integrates with Dac-Easy and sells for $69.95.

**Test, one two three**

Corpuz said that before recommending the package to anyone, he tested it with a standardized set of procedures he uses to check all new packages. The test included doing journal entries, introducing reports to the program and creating errors and glitches to see how the program would respond.

"I keep a list of the top six or seven accounting packages in my mind," Corpuz said. "And [Dac] has stayed on the list for the past two years." He said the package offers no unique functions but that its pricing and ability to live up to its advertisements are somewhat unique.

Wyatt Smith, a safety engineer at LTV Aerospace and Defense Co. in Dallas, said he set up some users in his company with Dac-Easy Accounting. His initial purchase decision, he admitted, was based on the price of an early version of the package. "We got it in, and it was a little difficult at first to work with, but then Dac came out with enhancements," Smith said.

"I thought it worked very well," he added. "The only disadvantage to it is you have to have someone who likes working with computers to set up the system and maintain it."

Smith suggested, however, that users look before they leap into the Dac package. "The only problem I would see is that a new company or a small company thinking about a computer would probably have trouble jumping right in with it," Smith added.

Corpuz said when he has had trouble understanding the program, he has found the Dac support line to be helpful.

"One way to measure how well it works is customer satisfaction," Corpuz said. "I haven't had anybody who looked at it and said it wasn't good."

# Hypercard

FROM PAGE 39

Steven Morelli, general manager of financial planning and control for H. J. Heinz Co., said he is using Hypercard to compile product lists, with Hypercard stacks linking the master list to stacks containing more specific product information.

Hypercard has already become part of Morelli's daily routine. "I'm using Hypercard on a regular basis for things like phone lists, my calendar and a things-to-do list. I can be in Excel and return to Hypercard in exactly the location that I left it," he said, referring to Microsoft Corp.'a Excel program.

Morelli said his wish list would include the ability to take data bases and load them into Hypercard, which would require Apple to release Hypercard code in the public domain, where it could be used by third-party developers. "It would give me a more powerful tool for updating data," he explained.

Not all have greeted Hypercard enthusiastically, however. "I'm not driven by any pressing need to use it," said Jeff Ehrlich, manager of product technology for General Electric Co. "There are so many great off-the-shelf products, I don't know why anybody has to create anything with Hypercard."

Ehrlich conceded that Hypercard offers interesting possibilities. "You can do some pretty impressive things with it," he said. "But I have more fundamental problems to solve — office integration, getting Macintoshes and PCs working together, communications. You really have to sit down and program with Hypercard."

Apple has promoted Hypercard as a "personal tool kit" for the everyman, allowing the average user to create applications on the Mac. Since its introduction in August, the package has been bundled with every new Mac purchased. Current Mac owners can receive Hypercard for $49. It requires at least 1M byte of RAM and two 800K-byte floppy disk drives.

**Promised too much?**

Industry experts said Apple may have promised too much with Hypercard. An average user trying to create applications using Hypercard will likely find himself in over his head, they said.

"Although many end users will tailor existing products to their liking using Hypercard, it doesn't necessarily mean that they have the skills to create a spreadsheet or a data base," said Bill Higgs, an industry analyst for Infocorp. "Experienced end users can create their own applications, but they'll have to know some of the principles of software programming."

Ehrlich likened Hypercard to a "next-generation Basic. It's about as hard as Basic," he explained. "You can get very elaborate with it."

However, Richardson said programming skills become unnecessary as third parties develop "stackware" to use with Hypercard. "I don't think most users are going to have to program," he maintained. "The more stacks that come out, the more people will build things with the stacks.

"I really don't think it was designed for everyone to program with," Richardson continued, noting that a programmer's guide is not included with Hypercard but must be requested.

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# DOS 386

FROM PAGE 37

sults in lower cost to the user, Williams added.

"For a typical configuration, the cost to the user could be less than half in a multiuser configuration rather than a LAN implementation," he said. "The user is able to use a single 386 as the main processor and then low-cost serial terminals, as opposed to PCs, as individual terminals." A second benefit, he added, is greater ease in configuration.

The DOS compatibility of Concurrent DOS XM Release 6.0, which takes advantage of extended memory, has also been extended to the DOS 3.3 level and reportedly will run well-behaved DOS applications on serial terminals. Concurrent DOS XM costs $395.

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# Time-sharing

FROM PAGE 39

you that you are missing out on one of the most exciting aspects of the personal computer revolution.

Growing out of the world of remote computing services, or time-sharing, Compuserve shifted first toward providing on-line data bases and, more recently, to creating an incredibly versatile electronic communications system. More than any other contemporary institution, Compuserve embodies the exciting direction in which electronic information technology is inevitably taking us.

Connecting with Compuserve is easily done with any PC equipped with a modem and communications software. Local dial numbers are available in virtually all North American cities of any size.

Logging in is simply a matter of entering your user ID number and password. From that point on, it is quite easy to navigate through Compuserve by means of the hierarchical menu system. You can check recent news stories, obtain market quotes, consult reference material, check movie reviews, airline schedules and fares, obtain weather reports and garner lots of other information.

The *Compuserve Almanac*, which lists all the data bases and services, is more than 200 pages long and typically lists four or five unique services on each page. New services are constantly being added.

### Worldwide link

The real power of the services that Compuserve provides is not simply in providing on-line access to information of various sorts, however useful that may be. Rather, it is in providing a sophisticated, electronic medium that enables individuals all over the world to communicate with one another about topics of interest to them.

Compuserve's Easyplex electronic mail facility is only part of this. You can look up other subscribers in the directory and send them E-mail messages. There is also an on-line real-time capability for two or more individuals to communicate with each other.

But the most important facility that Compuserve provides is the combination of these and other capabilities into the Compuserve forum. These are uniquely organized electronic "neighborhoods" in which people with common interests can get together to share ideas and information.

There are three basic types of forums on Compuserve:

- Computer forums are focused on types of computers, particular programming languages, software products and so forth.
- Professional forums are organized around particular professional interests like law, architecture or medicine.
- General-interest forums cover everything from gourmet cooking to religion, music, health, politics and humor.

Within a forum, you can leave messages for others on an electronic message board, read messages left by others, engage in on-line conferences (usually scheduled at specified times) or access the forum's data library.

Until you've worked with one or more Compuserve forums, it is hard to appreciate how useful they can be.

The computer forums, for example, are probably one of the best ways to learn about new hardware and software, what works and what doesn't, what problems other users are having and how they are solving them. Information center managers, for one, will find the computer forums to be an invaluable resource.

Zachmann is vice-president of research at International Data Corp.


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# Stimac

FROM PAGE 39

operations, so the best thing you can do is to have zero-wait state operation for your CPU. [With Compaq's Flex architecture], the CPU can operate out of the cache memory 95% of the time, and only 5% of the time does it need to go to main memory.

IBM's systems work on a one-wait state approach. There are an additional two cycles, with the 16- and 20-MHz cycles, where they typically have to wait for the accessing. So are they maximizing their CPU bandwidth? The answer is no. Only a cache-type architecture allows that in a cost-effective manner.

**Corporate accounts want micro-to-mainframe connection. And with the PS/2's ability to support multiple masters, they can slap in an IBM 370 on a chip. What are Compaq's options here?**
We could look at something like the [IBM Personal Computer] AT/370 or the 3270 Personal Computers, which were built on the AT architecture. We can take a look at the coprocessors in general. If you take a look at most of the peripheral cards, communications cards [and] 3270 cards, almost every local-area network card has a separate coprocessor on there that is handling the low-level protocols. So we are not lacking for coprocessor systems.

**What sense does it make to have a dual-bus containing the Micro Channel?**
We believe that any type of architecture that has Micro Channel and industry-standard [architectures] is probably the worst of both worlds. You don't really have the flexibility that you would like to have. You are forced to buy either a Micro Channel card or an industry card, or you have to have a power supply or space large enough to satisfy both requirements. So Compaq doesn't believe that is a reasonable architecture. Plus the micro-level timing is very difficult.

**What are the multitasking solutions available to Compaq besides IBM and Microsoft's OS/2?**
I think Unix offers certain alternatives. But again, [we don't want] to get into operating systems wars. One needs to decide on an operating system based on the applications one wants to develop around a PC.

If they want a multiuser-type system, there is Xenix. There are Unix solutions available, and those may do a better job than networking PCs together. If someone wants to run existing applications, the best that is available today is Windows/386. As new OS/2 applications come out, one will have to evaluate those new applications against today's existing applications.

**What are the company's options for exploring a communications strategy?**
There are a number of options. We differ in our philosophy a little bit from IBM with respect to how we see PCs connected to mainframes. We do believe some PCs will be connected to mainframes. We don't believe that every individual PC needs to be running OS/2 Extended Edition and have 4M to 6M bytes of memory on it. We believe that a more economical solution, a better work group solution, is to tie those individual PCs together into a network and use the network as a gateway to actually satisfy the host that is transferring data.

IBM's strategy is to sell their mainframes and minicomputers, and the type of architecture they are promoting will absolutely promote more sales of their host systems.

**With all its power, will a machine based on Intel Corp.'s 80386 continue to be a personal computer?**
I think it has some dual capabilities. It isn't just a single platform that is used for productivity. It is also an excellent platform for file servers and for computer-aided design. What we will also see are new applications around OS/2 and Unix that will further exploit the 386. It has taken almost a year for the people to recognize the power of it and be able to exploit it. I think you will see artificial intelligence applications moving down to the 386 as a delivery mechanism under $10,000.

# Data

FROM PAGE 37

row-and-column wizards at Lotus. Some 1-2-3 insiders have benchmark-tested Lotus's spreadsheet against a late beta-test, or preview, version of Excel and are itching to claim victory. Company officials, however, have no plans to release such benchmark results to the public. But maybe if you ask them off the record?

**Can I get a 370 this way?**
Just $3,349.95, four to eight hours of work and a screwdriver is all it takes to get an Intel 80386-based micro, kit and kaboodle — at least according to Heath/Zenith Consumer Products Group in St. Joseph, Mich.

The firm, which offers a variety of build-it-yourself kits, is offering a system identical to the 80386 machine currently offered by Zenith Data Systems. The only difference is that the Zenith Data Systems version costs more and comes assembled. Heath/Zenith is also considering offering a kit version of its Tension Mask Display monitor and may introduce a 386 laptop kit sometime next year. Any of you tinkerers want to take on Compaq?

**Win-Win.** A recent report from Sanford C. Bernstein & Co. describes IBM as being "back in a leadership role" with the introduction of the Personal System/2 line. But this role is not hurting Compaq and a handful of other PC cloners, which will continue to experience strong growth, according to Bernstein. Maybe there is room in this town for the two of them.

**Companies invent the darndest things.** Croresearch in Lyons, Colo., has an answer to those sticky Write/Protect tabs. For $1.69, users can buy Diskey, a device that slides into a floppy disk drive above the disk and serves as a temporary Write/Protect tab without the adhesive. Best of all, you only need one per PC.

**OS/2: Who needs it?** To Microsoft's apparent consternation, Lotus insiders report that their firm is positioning 1-2-3 Release 3.0, coupled with the Lotus/Intel/Microsoft Expanded Memory Specification Version 4.0, as a fine alternative to an OS/2 version of 1-2-3.

**Leading edge, sort of.** Manufacturers Hanover Vice-President Arthur Block says his firm is quickly moving to the next generation of hardware and software. But for Block, the next generation consists of 386 machines and the Microsoft Windows-based Excel. The firm will move to OS/2s "in a few years," Block says.

**There's more to it.** A *Computerworld* report on the long-awaited textual data base and personal information manager that Lotus founder Mitchell D. Kapor worked on drew reaction from some Lotus workers. Although many Lotus sources refer to the package as the "Mitch Product," that's not the whole story.

According to the Cambridge, Mass., spreadsheet colossus, it was Ed Belove, Lotus's vice-president of research and development, who wrote most of the code for the product that will touch down at Comdex/Fall '87 next month.

And let's not forget Jerrold Kaplan, former Lotus chief technologist, who provided much more than just the artificial intelligence know-how.

Barney is a *Computerworld* senior editor, microcomputers.


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| New Orleans | 10/14 |
| New York City | 8/5, 9/16, 10/14, 11/18 |
| North Jersey (Woodbridge) | 8/19, 11/5, 12/2 |
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# NEW PRODUCTS

## Systems

A system for capturing guard-tour data for immediate analysis at completion of tour has been introduced by **Sector Technology.**

The **Guard Tour Management** system consists of software for IBM Personal Computer AT compatibles, credit card-size microcomputers for reading bar code labels at checkpoints and bar code labels. The system supports the recording of such incidents as open safe, classified document not stored, door open and hazardous material spill.

The complete guard tour can be printed out, and statistical analyses of time variance and recorded incidents by guard can be performed.

Guard Tour Management software costs $1,400 plus $300 for each wand and recharging unit and 24 cents for each bar code label.

Sector Technology, Suite 444, 6 Skyline Place, 5109 Leesburg Pike, Falls Church, Va. 22041. 703-379-1800.

A 66M-byte Intel Corp. 80386-based system available in 16- and 20-MHz versions has been announced by **Advanced Logic Research, Inc.**

The system, called **386/2 Model R66**, accepts either an 80287 or 80387 coprocessor on the system board. Standard memory is 1M byte of 32-bit random-access memory expandable to 2M bytes on the system board without add-on memory cards. Other features include one serial and one parallel port, 1.2M-byte 5¼-in. floppy disk drive and eight expansion slots.

The 386/2 Model R66 costs $3,490.

Advanced Logic Research, 10 Chrysler, Irvine, Calif. 92718. 714-581-6770.

## Software applications packages

**Accel Technologies, Inc.** has added **Tango-Schematic**, a schematic capture package, to its Tango line of computer-aided design and engineering software products.

Tango-Schematic is said to provide a front end to Accel's Tango-PCB and Tango-Route circuit-board design systems. Included are such graphics editing features as four line types, four text sizes and rubberbanding of wires and buses.

Other features include one-step commands to move, rotate and scale text and components; a built-in documentation editor; more than 3,100 library parts; block functions; and five-level zoom capability.

Tango-Schematic runs on IBM Personal Computers. It is priced at $495.

Accel Technologies, 7358 Trade St., San Diego, Calif. 92121. 619-695-2000.

Two programs from **Softcraft, Inc.** are said to provide users of Wordperfect Corp.'s Wordperfect with laser or dot matrix printers with desktop publishing capabilities.

**Laser Fonts** and **Fancy Fonts for Wordperfect** use Wordperfect's formatting features to produce unlimited headline and text styles and sizes. Laser Fonts, which can be used on Hewlett-Packard Co. Laserjet Plus, Series II and compatible laser printers, downloads fonts and automatically makes printer definition files for Wordperfect.

Fancy Fonts for Wordperfect, which can be used for Epson America, Inc.'s FX and compatible printers, is said to achieve near-laser quality printed output.

Laser Fonts costs $180. Fancy Fonts for Wordperfect costs $210.

Softcraft, Suite 500, 16 N. Carroll St., Madison, Wis. 53703. 608-257-3300.

The accounts receivable module of the **Businessworks PC** business accounting package has been introduced by **Manzanita Software Systems.**

The accounts receivable system is said to be capable of handling an unlimited number of customers, tracking such items as monthly and year-to-date sales and adjustments, highest balance, credit limit and open credits. It can produce invoices and statements on preprinted forms or plain paper and can automatically generate recurring invoices. It also includes the ability to export financial information and reports.

Each module in the Businessworks PC program costs $395. The System Manager costs $95.

Manzanita Software Systems, Suite 200-A, One Sierragate Plaza, Roseville, Calif. 95678. 916-781-3880.

## Software utilities

A source-level Dbase debugger has been announced by **HJS Research, Inc.**

Designed for use with Ashton-Tate's Dbase III+ and Foxbase V.20, the debugger, called **Dbug**, is said to allow users to enter break points that permit the program to execute until the break point is encountered. Break points may be entered at any location in the code.

Other features include watch points and trace points.

Dbug uses multiple windows, hot keys and more than 30 debugging commands. Access to Dbase commands and functions is supported.

Dbug costs $195.

HJS Research, Suite 8162, Cedar Court, Monmouth Junction, N.J. 08852. 800-323-1809.

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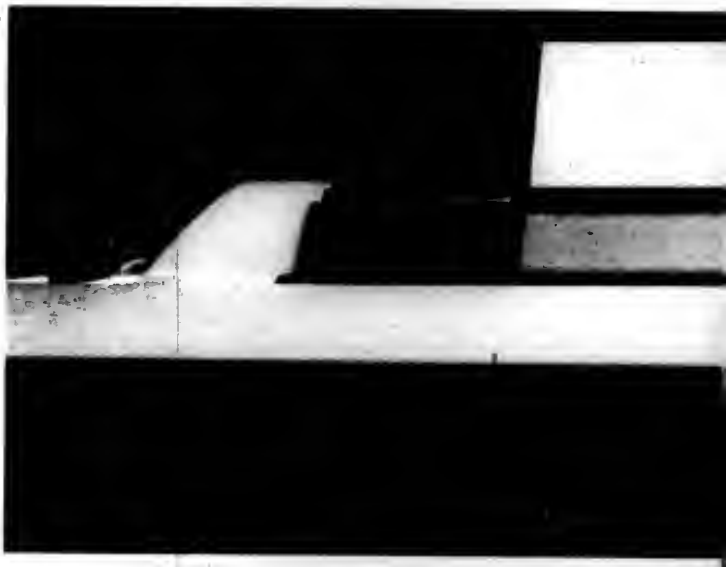

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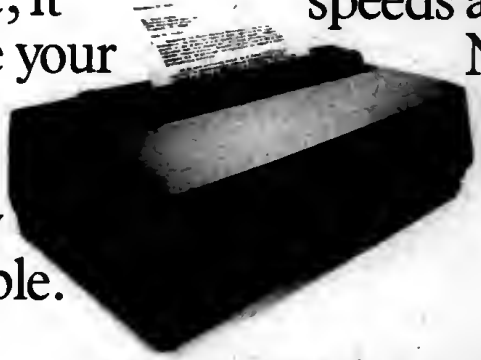

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A macro package for use with Microsoft Corp.'a Works on the Apple Computer, Inc. Macintosh has been announced by **Lundeen & Associates.**

The software, called **Worksplus Command**, can be installed directly onto the Microsoft Works disk. It adds such features as the ability to print multicolumn labels and generate tables of contents and indexes for word processing documents. It will also perform global search-and-replace in data base and spreadsheet documents.

Command includes a programming language for extending and customizing Works. It allows access to all Works documents and comes with more than 100 built-in functions.

Worksplus Command costs $99.95.

Lundeen & Associates, P.O. Box 30038, Oakland, Calif. 94604. 415-893-7587.

## Development tools

A version of the U.S. Department of Defense validated Ada development system designed to run on the standard IBM Personal Computer has been announced by **Meridian Software Systems, Inc.**

**Adavantage 2.0** is said to compile more than 1,000 line/min. It includes such Ada features as tasking, exceptions, generics and separate compilation.

According to the vendor, the Ada compiler is portable across different system architectures. It is accompanied by a set of support tools designed to manage an Ada program library data base.

Adavantage 2.0 costs $795.

Meridian, Suite 105, 23141 Verdugo Drive, Laguna Hills, Calif. 92653. 714-380-9800.

The **Advanced Development Toolkit**, a collection of software tools for customizing the DAP 1200 series of Data Aquisition Processors, has been announced by **Microstar Laboratories.**

According to the vendor, C programs developed with the tool kit can be installed by the multitasking operating system of the DAP 1200. The tool kit provides access to on-board resources such as timers and output ports.

Also announced were two digital versions of DAP 1200 boards, the **1200/2D** and the **1200/4D.**

The Advanced Development Toolkit costs $200. It requires the Microsoft Corp. C compiler Version 3.0 or higher. The DAP 1200/2D and the DAP 1200/4D cost $995 and $1,195, respectively.

Microstar, 2863 152nd Ave. N.E., Redmond, Wash. 98052. 206-881-4286.

## Software enhancements

An enhanced version of the **Venix System V** Unix operating system for personal computers has been announced by **Venturcom, Inc.**

Release 2.3 features real-time extensions, adherence to AT&T standards, support for the IBM Enhanced Graphics Adapter (EGA) board, AT&T binary compatibility and developer's tools.

Performance enhancements include improved memory management to minimize I/O, a more efficiently coded kernel, a larger 1,024-byte file system and an extended buffer cache.

The full Venix 2.3 system costs $990.

Venturcom, 215 First St., Cambridge, Mass. 02142. 617-661-1230.

## Data storage

A removable-cartridge Winchester disk drive featuring a formatted capacity of 44.5M bytes has been announced by **Syquest Technology.**

The **SQ555** offers an average access time of 25 msec and a sequential data transfer rate of 600K byte/sec. Features include an embedded small computer system interface, an 8K-byte buffer, error correction control and automatic retry and self-diagnostics.

The SQ555 drive costs $995; the cartridge costs $100.

Syquest, 47923 Warm Springs Blvd., Fremont, Calif. 94539. 415-490-7511.

**National Memory Systems Corp.** has enhanced its **ER-9000** series of tape backup products for IBM's AIX operating system and RT Personal Computer.

The series offers AIX 2.1.1 compatibility, 1,600 bit/in., 3,200 bit/in. and 6,250 bit/sec. options. According to the vendor, the product can run under Unix's CPIO, back up and restore commands and provide ASCII file conversion capabilities.

The 1,600 bit/in. ER-9000 series costs $5,000.

National Memory, 30 Lindbergh Ave., Livermore, Calif. 94550. 415-443-1669.

## Printers/Plotters/Peripherals

Two monochrome graphics terminals featuring Tektronix, Inc. 4010 and 4014 emulation have been announced by **Rebus Corp.**

Both the **Rebus Orange AG** and the

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Clearly, a technology this big demands more than a PC. CASE belongs on a mainframe. Because only a mainframe can provide you with the capacity to undertake large development projects. And only a mainframe will allow you to easily share data among all developers, thereby unifying development efforts.

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With CasePac, all your developers build upon one set of development data, and work with one

**A Rebus** *graphics terminal*

**Rebus Orange AGB** offer drawing speeds up to 2M pixel/sec. The AG offers 1,024- by 391-pixel resolution, and the AGB features a selectable-interlace mode for displays of 1,024 by 391 or 1,024 by 768 pixels.

The Rebus Orange AG costs $595; the AGB costs $695.

Rebus, P.O. Box 36503, San Jose, Calif. 95158. 800-426-7090.

The **Laserimage 1000** 6 page/min printer featuring 31 standard fonts has been introduced by **Personal Computer Products, Inc.**

The printer offers RS-232 serial, Centronics parallel and RS-422 interfaces. It emulates the Hewlett-Packard Co. Laserjet Plus, HP Laserjet Series II, IBM Proprinter, Diablo Systems, Inc. Diablo 630 and Epson America, Inc. FX-80 printers. The Laserimage 1000 also has an optional pop-in cartridge providing HP 7475A plotter emulation.

A 150-sheet paper tray is standard, and an optional 250-sheet tray is available. Resolution is 300 dot/in. Standard memory is 1M byte, expandable to 2M bytes.

The Laserimage 1000 costs $2,495.

Personal Computer Products, Suite 100, 11590 W. Bernardo Court, San Diego, Calif. 92127. 619-487-5809.

The **Mac & Touch Screen**, an integrated touch-screen system for the Apple Computer, Inc. Macintosh personal computer, has been announced by **Microtouch Systems, Inc.**

According to the vendor, the all-glass touch screen features a mouse-compatible software driver that allows all Macintosh software, including Apple's Hypercard, to work with the screen without modification.

The screen is based on a patented analog capacitive sensing technology. It offers a resolution of 1,024 by 1,024 touch points.

The Mac & Touch system is priced at $995.

Microtouch Systems, 10 State St., Woburn, Mass. 01801. 617-935-0080.

## Board-level devices

The **Multivid 16L**, a graphics board for use with such graphics applications as Autodesk, Inc.'s Autocad, has been introduced by **Dolen Computer Corp.**

Part of the Multivid product line, the add-in card features an automatic switch to IBM Enhanced Graphics Adapter or Color Graphics Adapter video display mode when used with variable-rate scanning monitors.

Multivid boards are priced from $699 to $2,895.

Dolen, 18 Knight St., Norwalk, Conn. 06851. 203-855-0895.

An analog and digital interface card designed for the Apple Computer, Inc. Apple II, II+ and IIE has been announced by **Naylor Industries.**

The card, called the **Data I/O 8**, provides eight channels of analog inputs and eight channels of analog outputs as well as 24 digital input bits and 24 latched digital output bits.

According to the vendor, it allows the Apple computer to make electrical measurements, send and receive control signals and generate wave forms for industrial, scientific and educational applications.

Data I/O 8 is programmable in Basic or assembler and may be installed in slots one through seven.

Data I/O 8 costs $295, including a manual and cables.

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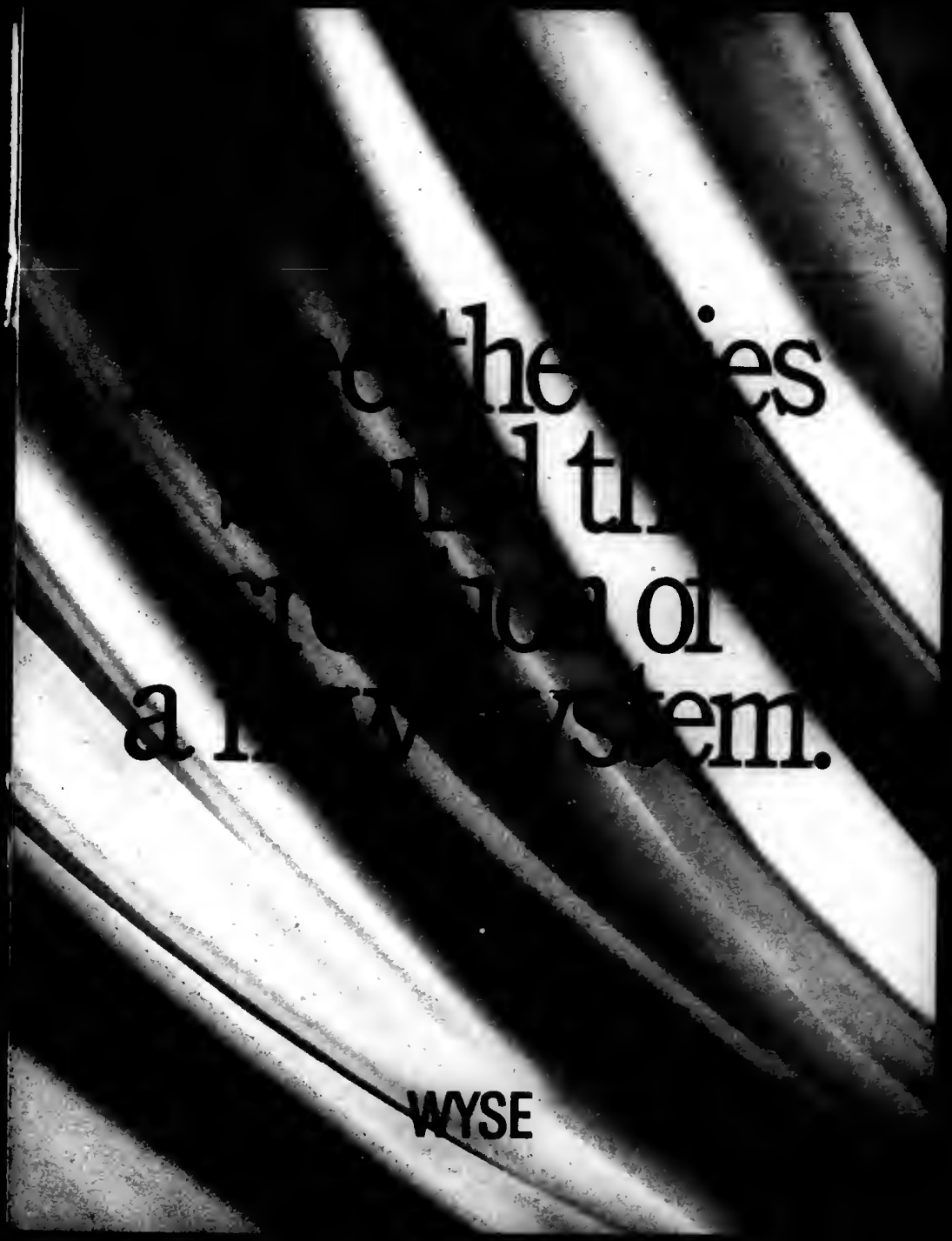
WYSE

# The Big Ban

# ng Theory.

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*The WYSEpc 386 driving our VGA color monitor. WyseWindow™ LCD provides system status and activity readout.*

**WYSE**

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# The Theory

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# y of Evolution.

With total interchangeability. Wyse already makes available a wide array of graphics, memory expansion, and interface modules.

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In a world in which survival belongs to the fittest, the only true survivors are those with the capability to remain fittest, longest. This is a theory applied with great practicality in SystemWyse.

*Three SystemWyse graphics solutions: our 8 MHz desktop with a Wyse VGA monitor; our 12.5 MHz professional desktop and VGA color monitor; and our 12.5 MHz, zero wait state system driving the WY-700 hi-res graphics display.*

**WYSE**

**We make it better, or we just don't make it.**

# The Theory

## It all works together.

Most of all, SystemWyse is a system for creating solutions. Uniquely integrated solutions that range from desktop publishing installations and powerful CAD/CAE workstations, to 16-node multi-user systems. All are based on industry standard operating systems, with over 1000 *tested* applications available.

At the heart of SystemWyse are our Modular Systems Architecture computers. They're the most powerful PC family in the business. And, with more possible configurations, the most flexible.

But SystemWyse also encompasses an entire catalog of compatible, superbly designed peripherals. Including one of the industry's most popular lines of computer terminals. Color and monochrome monitors (VGA, EGA and CGA compatible) and high resolution graphics subsystems. Plus memory expansion, graphics, and interface modules. All are designed and manufactured by Wyse to link effortlessly, and work together in singular harmony.

*A SystemWyse Desktop Publishing solution: our 12.5 MHz professional system coupled with our WY-700 hi-res graphics subsystem.*

It's all driven by a unified design vision. That's why SystemWyse has a look and feel that's consistent throughout. Computers and terminals with identical screens and keyboards. Styling that has set a new standard for the industry. And user-oriented features that are the hallmark of Wyse design.

*WYSEpc 386 drives our 19" color monitor for CAD/CAE applications.*

Such as the advanced ergonomics. The crisp characters and high resolution screens of our terminals. The clarity and vivid colors that distinguish our monitors. The built-in help facility and simplified set-up menus of our systems.

Standing behind our ability to deliver on the promise of SystemWyse is our unique manufacturing capability. As one of the industry's most vertically integrated producers, we make all our own

# of Relativity.

*A WYSEpc 386 powered multi-user system, with our WY-60 alphanumeric and WY-99GT graphics terminals as work stations. All peripherals link to the system with simple telephone-type connectors.*

products. And we make virtually everything from the ground up. While most companies use sub-assemblies purchased from someone else, we gain infinitely greater manufacturing control by beginning with components.

The result is a means to create solutions of manifestly superior quality and value. Solutions that are at once both elegant, yet relatively easy to construct. Solutions that seem custom designed for each specific application. We call them, simply, "SystemWyse solutions."

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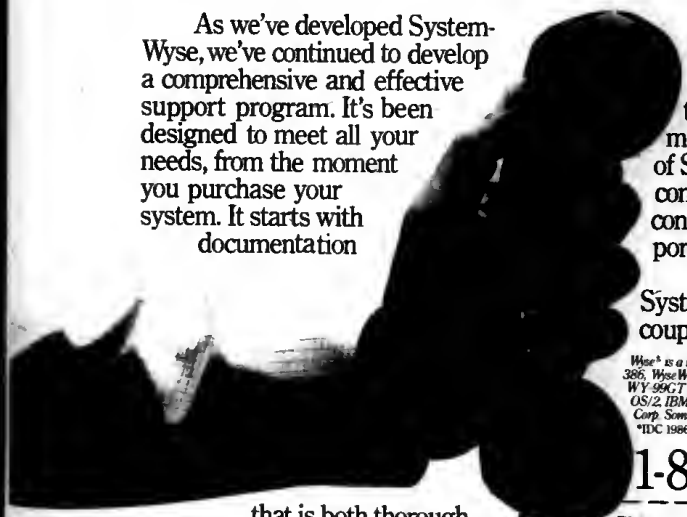
# The conclusive support for our theories.

As we've developed SystemWyse, we've continued to develop a comprehensive and effective support program. It's been designed to meet all your needs, from the moment you purchase your system. It starts with documentation



that is both thorough and understandable. For easy-access post-sale support we provide a staff of technical experts in the field plus a hotline to answer your questions. And you are probably now within 50 miles of a Wyse service center. We also conduct continuous software testing to ensure compatibility and beta site testing for independently developed custom applications.

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# NETWORKING

DATA STREAM

*Thomas Davenport*

## Educating telecom staff

MIS executives and others who set their companies' information strategy for the coming decade had better think about educating telecommunications professionals — if they have not already begun to do so.

With the 1990s will come a new set of job demands; to meet them, telecom managers will have to be business-oriented, applications-driven and functionality-concerned. They will also have to be knowledgeable about data communications issues. That spells trouble for those who have been technically oriented, cost-driven and concerned only with voice issues. Let's look at the evidence.

Much has been said about how the telecommunications environment is changing. By the early 1990s, a lot of this change will have happened. Voice and data will be combined at the desktop and across global networks. Integrated Services Digital Network will be a reality. Network management will be highly automated. Bandwidth will be managed as a corporate asset. Communications capabilities will be an integral compo-

*Continued on page 63*

# 3M will take the ISDN plunge

*Launches ambitious million-dollar project over five-year span*

BY KATHY CHIN LEONG
CW STAFF

ST. PAUL, Minn. — While most Fortune 1,000 companies have adopted a wait-and-see attitude toward the Integrated Services Digital Network (ISDN), 3M Co. has embarked on an ambitious project to replace its entire telecommunications system with ISDN gear during the next five years.

Although 3M officials would not specify how expensive the project will be, they said they are certain the plan to equip employees with ISDN telephones and terminals will cost millions of dollars.

While most other ISDN projects in the U.S. today are pilot programs, 3M's installation will be a working business network planned for the long haul, 3M officials said.

**Planning links**

The company's five-year plan calls for two regional Bell holding company subsidiaries, U.S. West Information Systems and Northwestern Bell, to link up some 18,350 employees spread across 23 3M locations here and in Minneapolis.

Another long-term goal is to tie Texas sites with the network in Minnesota, according to 3M MIS Manager Marke Greene, who is based in Austin, Texas.

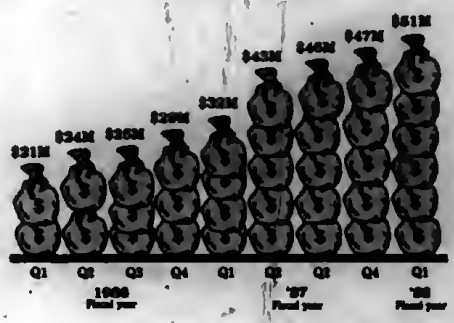
According to Greene and Keith DeStasio, another 3M MIS supervisor, the implementation will give the company three key benefits: flexibility in using nonproprietary customer-premise equipment; cost savings through minimizing the number of telephone lines for each employee; and "networking synergism" between 3M facilities in St. Paul and a new corporate site

*Continued on page 63*

## Data View

The bride's dowry

*The completed merger of Bridge with 3Com forms a union with close to $200 million in revenue and a compound annual growth rate of 57%*




INFORMATION PROVIDED BY 3COM CORP.
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# Fiber system links LANs

BY ELISABETH HORWITT
CW STAFF

YONKERS, N.Y. — Codenoll Technology Corp. is set to announce this week a fiber-optic networking system supporting a wide range of protocols, including IBM's Token-Ring, Ethernet, the Manufacturing Automation Protocol (MAP) and, later, the Fiber Distributed Data Interface (FDDI) standard.

The Fiber Optic Cabling Universal System, which will be unveiled at Novell, Inc.'s Networld show in Dallas, allows users to use one fiber-optic cabling system and network hub to support

*Continued on page 56*

# MNP's role as standard still at issue

BY ELISABETH HORWITT
CW STAFF

GENEVA — Representatives from U.S. and European modem makers and European Postal Telephone and Telegraph authorities who met here recently were unable to reach an agreement about what part the Microcom Networking Protocol (MNP) should play in an evolving CCITT error-correction standard for modem-based transmissions.

MNP, an error-correction protocol developed by modem maker Microcom, Inc., is currently supported by all major value-added network vendors and "everyone who makes V.22 bis modems except Hayes Microcomputer," according to Microcom Vice-President of Technological Planning Gregory Pierson.

However, there is also strong support in the communications industry for an error-correction standard based on Link Access

*Continued on page 60*

**Inside**


- Excelan ties Xenix via TCP/IP. Page 56.
- Dialcom, Western Union add X.400 services. Page 60.
- Standard Microsystems offers Arcnet product line. Page 66.



```
printf("Hello, MAINFRAME world\n");
```

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# Excelan ties Xenix via TCP/IP

**Excelan, Inc.** in San Jose, Calif., recently announced the availability of Exos 10614T, a turnkey package said to allow users of **Santa Cruz Operation's** (SCO) Xenix System V to communicate with a wide variety of systems using the Transmission Control Protocol/Internet Protocol (TCP/IP) networking protocol. It also supports SCO's Xenix-Net Distributed File system.

Concurrently, SCO announced Xenix-Net 1.2, which incorporates a generic Xenix-IBM Netbios device driver. The two vendors' products, working together, allow users of Microsoft Corp. MS-DOS-based applications to access files on a Xenix system through a TCP/IP connection. Available now, Excelan's Exos 10614T is priced at $1,295 for both the board and the software and at $595 for just the TCP/IP software. SCO's Xenix-Net 1.2 is available now and costs $595 for a single-server license.

**Micro Tempus, Inc.** in Montreal has signed cooperative agreements that will bring its micro-to-mainframe software products to a greater range of equipment.

One agreement reportedly calls for migrating Micro Tempus's Tempus-Link, Tempus-Access and Tempus-Share products to hardware links provided by Italian computer manufacturer **Ing. C. Olivetti & Co.**

According to the terms of a second agreement, Micro Tempus will work with **Digital Communications Associates, Inc.** (DCA) to develop compatibility between the Tempus product line and DCA's recently introduced Irmalan 3270 and Irmax DFT communications product families. Micro Tempus already supports DCA's existing Irma line of terminal emulation boards.

Yet another networking product on IBM's Netview bandwagon: **Paradyne Corp.** recently announced Analysis NV/PC, which is said to allow the vendor's Analysis 6510 or 5530 network management systems to send Autoscan alarms to IBM's host-based network management system via the Netview/PC interface.

**Pacific Bell** will soon join the ranks of Bell operating companies that offer Digital Data Service (DDS) with Secondary Channel support.

Up until about a year ago, DDS was typically offered with an in-band 8K bit/sec. channel for transmitting control and diagnostic information.

Secondary Channel support allows digital devices and carrier-based links to be managed by the same diagnostic and monitoring systems that manage analog facilities, industry sources say.


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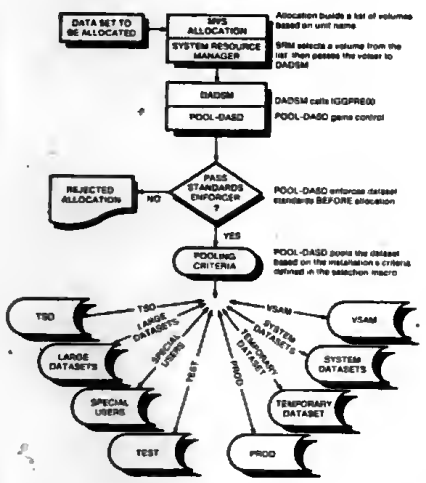


POOL-DASD is an IBM MVS mainframe software product that dynamically controls data set pooling and enforces installation data set standards. POOL-DASD operates as a "frontend" to the DADSM pre-processing and post-processing exits (IGGPREOO/IGGPOSTO). POOL-DASD gets control during the five basic DADSM functions: Allocate, Extend, Release, Scratch, and Rename.

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# Fiber

CONTINUED FROM PAGE 53

whatever networking protocols they need to install, according to Codenoll President Michael Coden.

Workstations equipped with standard networking boards are linked to a Codenoll Codestar hub in a star configuration. Hubs within a given area are then linked via a larger hub, called the Multiport Multiconnect Repeater, also scheduled to be introduced at Networld this week. The Multiport Multiconnect Repeater supports up to 15 Codestars. Priced at $1,095, it is scheduled for December availability. In addition, Codenoll is expected to announce new Starcoupler technology that halves the price of Codestar workstation hubs, according to Coden. Two Codestars will be introduced, a seven-port hub priced at $1,195 and a 19-port hub priced at $2,195. The products are available now.

Codestars can be reconfigured to support different types of networking protocols by switching Codenet adapter cards, Codenoll said. The vendor offers the following adapter cards:

- Codenet 3402, priced at $695, which supports fiber-optic Arcnet.
- Codenet 3051, priced at $995, which supports Ethernet boards from 3Com Corp., Novell and other vendors.
- Codenet 3061, priced at $1,195, which supports workstations running IBM's Netbios over IBM's PC Network or Token-Ring.
- Codenet 3410, priced at $995, which supports MAP networks.

All of the products are available now, Codenoll said.

**More to come**

Codenoll plans to introduce products that implement the IEEE 802.6 FDDI standard "just as soon as Advanced Micro Devices and National Semiconductor come out with chip sets" that enable the network vendor to implement FDDI at affordable prices, Coden said.

Currently, the two chip vendors are citing a one-year time frame, but Coden said he expects further delays.

The FDDI system, unlike other networking interfaces, will require Codenoll users to take out their existing Starcoupler and substitute a new box, Coden said.

The vendor's fiber-based products will be used at Networld to connect Novell servers as well as workstations and networking products at 250 exhibits throughout the show floor, Coden said.

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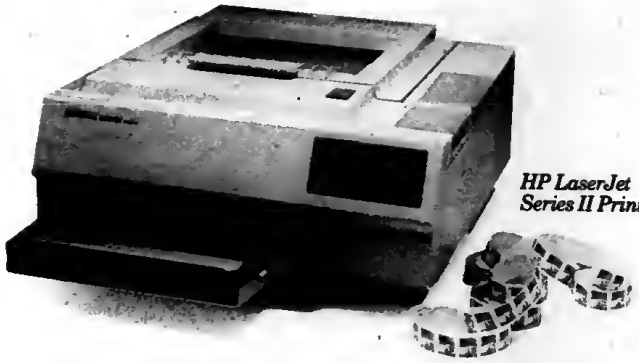

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HEWLETT PACKARD

# Dialcom, Western Union add X.400 services to E-mail

BY PATRICIA KEEFE
CW STAFF

Two major suppliers of electronic mail systems and services recently introduced services based on the CCITT X.400 standard for communications between dissimilar message systems.

Dialcom, Inc. in Rockville, Md., announced U.S. commercial availability of its X.400 message-handling service (MHS) for public and in-house systems. Western Union Corp. in Upper Saddle River, N.J., said it will provide X.400 and document-transfer capabilities on its Easylink E-mail service in the first half of 1988.

The company also said it will develop two-way facsimile service through Easylink and Telex services and will introduce a version of its Instant Mail Manager communications software to run on Apple Computer, Inc. Macintoshes.

In addition, Western Union is proceeding with the implementation of a comprehensive electronic data interchange service on Easylink, with beta testing currently in progress.

The X.400 MHS is part of Dialcom's new Pathfinder electronic message-handling and message-interchange services. These services include interconnects to private E-mail systems and message interchange among Dialcom's 17-country, 260,000-member international user network. Dialcom also said it will be British Telecom's preferred gateway for X.400 message traffic from the U.S. to England. In addition, the vendor announced that its X.400 system is linked to two public X.400 messaging systems — British Telecom Gold in the UK and CNCP Telecommunications in Canada. Telecom Gold launched Gold400 in June, while CNCP, now in beta-test mode, is said to be planning its launch by year's end.

**DIALCOM CLAIMED it has successfully completed compatibility tests with the in-house X.400-compatible E-mail systems developed by Digital Equipment Corp. and Data General Corp.**

Dialcom claimed it has successfully completed compatibility tests with the in-house X.400-compatible E-mail systems developed by Digital Equipment Corp. and Data General Corp.

Message interchange for IBM's Professional Office Systems and Wang Laboratories, Inc.'s Office mail systems will be added by early 1988, the vendor said. The first demonstration of Dialcom's Administrative Domain software that works with IBM's version of X.400 will be at Telecom '87 this week in Geneva. In addition, Dialcom will work with other hardware and software vendors of E-mail systems as soon as they develop their X.400 software.

Among those working on X.400 software is Western Union, which said the scheduled cutover of its X.400-based MHS in early 1988 will facilitate the connection of Easylink with other X.400-based domestic and international electronic-messaging systems. Testing on the X.400 service will begin next month with a European administration.

The document-transfer program will make it possible to send documents in revisable form between dissimilar word processors and software packages, the vendor said.

The facsimile-to-Easylink or facsimile-to-telex delivery option, currently under development, will make it possible to send documents in revisable form between dissimilar word processors and software packages, the vendor said. It also will expand Western Union's delivery capabilities to let users send text messages directly from a facsimile machine for delivery via any Easylink messaging option.

Used in conjunction with the Easylink binary file-transfer capability introduced earlier this year, the Macintosh version of Instant Mail Manager will include file transfer with X.PC error detection and correction protocols.

# MNP's role

CONTINUED FROM PAGE 53

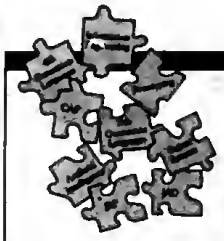
protocols (LAP), some of which are part of the Integrated Services Digital Network (ISDN) standard.

The group, which met for more than a week under CCITT auspices, could not reach the consensus necessary to make a formal recommendation to the standards committee on what the CCITT protocol should embody, according to Fred Burg, an AT&T Bell Laboratories Standards Planning Department supervisor who attended the meeting. Participants agreed to recommend that the future standard be compatible with the existing installed base of MNP modems and that MNP be incorporated into the standard.

However, Burg said, the group could not reach a consensus on what part of the standard would hold MNP: the main body or the appendix. "If MNP is in the appendix, then conformance to the protocol is not sufficient for conformance to the CCITT standard," he explained.

MNP would only become part of the main body of the standard as an alternative to a LAP-based protocol, which the group agreed "would be included in the standard as the basis for all future development," Burg said. Systems supporting MNP would not be able to communicate with LAP-based systems unless they dispensed with error-control protocols entirely, he said.

During the meeting, Hayes Microcomputer Products, Inc. submitted a proposal for modem vendors to implement both protocols. The group determined that a second set of error-correction code would take up between 5K and 10K bytes of read-only memory, resulting in a cost hike of $1 or $2 per modem, Burg said.



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LIfE has also been piping the information to the VP of Marketing in the form

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to call the customer again in 60 days. (Remember Sales? They started all this).

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# Educating

CONTINUED FROM PAGE 53

nent of computer applications, not a general-purpose utility.

If you want your organization to to be ready when the technology is ready, you will need to significantly upgrade the skills of your telecom staff in the following areas:

- Understanding the business strategies that drive telecommunications decisions.
- Understanding the technical underpinnings of computing and telephony and how they fit together.
- Knowing the agendas of vendors and being able to manage them rather than being managed by them.
- Expressing complicated business and technical arguments in clear, simple terms to senior managers.
- Managing large projects and large numbers of sophisticated employees.

How many of your telecom employees have this expertise? Many MIS managers complain that their telecom people have difficulty dealing directly with users, that they rely too heavily on vendors — AT&T in particular — and that they are not taking total responsibility for system operations and performance.

There are two ways to handle this situation if it exists in your company: educate your telecom managers or bring in new, skilled people.

Several communications vendors whose account executives need skills similar to those of telecom managers are making massive investments in educating their people. Bell Atlantic Corp., for example, has a "Top Gun" program for its most talented account executives and systems designers. The program consists of 80 classroom days of education and covers subjects ranging from the value-added chain to data link protocols. AT&T has a similar program.

Some companies have taken the approach of bringing employees with primarily computing backgrounds into the telecom function. These people are more likely to be business-oriented and more conversant with applications and data issues. However, they typically know little about establishing and operating voice networks. The future will demand individuals who are accomplished in all areas of information systems.

Do not expect these considerations to remain the concern of information systems and telecom managers only. Senior executives are learning from executive education programs and business publications, as well as from each other, that information systems are strategic and communications are a big part of any systems application. And those managers will want to know that the telecom resource is being managed not only efficiently but in a way that will let their companies enter the Information Age.

Davenport is director of research at Index Group, an information management consulting firm headquartered in Cambridge, Mass.

# ISDN plunge

CONTINUED FROM PAGE 53

in Austin. "We know there is a certain amount of risk taking, but we wouldn't go into it if we didn't have a good understanding of ISDN," DeStasio said.

Greene stressed that the move to ISDN was a corporatewide decision. "We want to make this place a completely digital environment," he said. "We decided a number of years ago that our business strategy would be met best through ISDN."

A major catalyst for 3M's decision to go with ISDN was the realization that its current Centrex network, based on an antiquated analog central office switch, would not satisfy its telecommunications needs over the long term, according to officials.

The planned ISDN system will give users such features as the ability to view a caller's phone number and the ability to move phones without changing numbers. Some 200 workstations will initially be a part of the ISDN installation.

**Still in planning stage**

Company officials are the first to admit that 3M's ISDN project remains in the planning stage. Real ISDN business applications have yet to be determined, they said.

But 3M stressed it will begin a user analysis as soon as the lines are installed. Issues that will need to be addressed include employee training, integrating 3M mainframe data centers that consist of IBM and Digital Equipment Corp. gear into the ISDN network and determining which applications will benefit most from the new technology.

The new network will employ existing twisted-pair telephone wire to handle simultaneous voice, data, image and facsimile transmission at a range of 9.6K to 64K bit/sec. It will use the ISDN Basic Rate Interface specification.

Local ISDN communications services in Austin will replace a Rolm Corp. CBX 9000 private branch exchange that the company has been using for several years. Greene said the company is not interested in being its own telephone company. Turning over responsibility to the local telephone company will be a relief, he said. The move to ISDN services will be a gradual evolution, DeStasio said.

"The [customer premises equipment] vendors are just beginning to manufacture ISDN terminals and devices. It will take time. And that's OK with us," he concluded.

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## NEW PRODUCTS

### Local-area network hardware

**Standard Microsystems Corp.** has introduced a family of **Arcnet** products for personal computer local-area networks using twisted-pair cabling.

The product line features an Arcnet Network Controller Board that fits in an expansion slot of any IBM Personal Computer or compatible. Multiple PCs are connected to a single twisted-pair segment in a daisy chain or multidrop configuration. Network expansion is achieved by connecting twisted-pair segments with a two-port Twisted-Pair Repeater, and a twisted-pair network can be connected to a coaxial network with a two-port Twisted-Pair Link. The Arcnet-PC250 Controller Board costs $295. The Twisted-Pair Link and Repeater cost $375 each.

Standard Microsystems, 35 Marcus Blvd., Hauppae, N.Y. 11788. 516-273-3100.

### Customer-premise equipment

A switching CCITT X.25 packet assembler/disassembler (PAD) capability for local and remote data gathering in mixed protocol environments has been announced by **Develcon, Inc.**

The product functions as a stand-alone switching PAD permitting up to 64 asynchronous subscribers to communicate through dual, independent links with both host mainframes and packet data networks operating under the X.25 protocol. The product also allows packet-to-packet transfers between X.25 connections.

Develcon, 6701 Sierra Court, Dublin, Calif. 94568. 415-829-6200.

### Links

A remote Ethernet bridge that is said to merge two distant Ethernet local-area networks into a single network has been announced recently by **Advanced Computer Communications.**

The bridge, designated the **ACS 4030**, offers a choice between adaptive and static routing. Adaptive routing is a continual process during which the ACS 4030 automatically adjusts to the addition or removal of network devices. If access to specific network devices must be prohibited for security reasons, the manager can code restrictions into an ACS 4030 static configuration table.

The ACS 4030 is protocol-independent. Up to two modem lines with rates from 2,400 to 64K bit/sec. are supported.

The ACS 4030 costs $4,975.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101. 805-963-9431.


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### File servers

**CYB Systems, Inc.** has announced a high-end addition to its **U68** series of **Unite** network processor servers.

A U68E processor server is said to be capable of providing network server and device sharing functions for up to 32 personal computer users while simultaneously delivering Unix processing to departmental terminals or PCs. A U68E configuration consisting of a Motorola, Inc. 68020 processor, 4M bytes of memory, a floppy drive, 778M bytes of disk, an Ethernet adapter, eight serial ports and two printer ports is priced at $53,645.

That price includes Unix and Unite software licenses with documentation.

CYB Systems, Suite 2017 Infomart, 1950 Stemmons Freeway, Dallas, Texas. 75207. 214-746-5390.

### Electronic mail

**Version 2.0** of **Oatmail**, the personal computer gateway to Digital Equipment Corp.'s Vaxmail and All-In-1 office automation systems, has been announced by **OA Technologies, Inc.**

Oatmail Version 2.0 allows PC users to create, send and receive All-In-1 mail and Vaxmail. It features a window-driven user interface, multiple host access, wild-card transfers, support for many data communication front ends and support for DEC's Ethernet LAT protocol.

Oatmail provides automated mail pick-ups, delivery and file-transfer capability. It includes DEC VT220 terminal emulation and a choice of transfer protocols. It costs $300.

OA Technologies, 10001 Craig Road, St. Louis, Mo. 63146. 314-432-3622.

### Diagnostic equipment

A multiline dial backup system called the **Restorer** has been announced by **Atlantic Research Corp.**

The system is said to restore failed point-to-point and multipoint circuits by temporarily rerouting data through the dial-up network. It offers end-to-end restoration for leased lines, featuring the ability to share and allocate dial backup resources.

It also provides one integrated system interface for point-to-point and multidrop circuits.

The system is made up of the vendor's MDB-100 central-site dial backup unit, ADU-50 remote-site dial units and a terminal. It can interface up to 512 leased lines. Typical system prices range from $13,000 to $50,000.

Atlantic Research, 7401 Boston Blvd., Springfield, Va. 22153. 703-644-9190.

# SYSTEMS & PERIPHERALS

HARD TALK

*James Connolly*

## Fighting the current

Row, row, row your boat, gently down the stream. Merrily, merrily, merrily, merrily, life is but a dream.

How about rowing not-so-gently *up*stream with only one oar — and still being fairly merry? That is the situation in which some users of the IBM System/38 find themselves. They are happy with their machines, but life is getting complicated as they fight the current — IBM and its failure to outline a growth path for high-end System/38 users.

It is not a case of IBM not having such a path. Whether it is a good selection or a poor one, IBM is expected to announce the System/36 and 38 follow-on product, code-named Silverlake, next year. The complaint from System/38 users is that information about Silverlake has been taking a circuitous route — through analysts, the press or selected users — before being passed on second- or third-hand to the general System/38 community. That method is subject to the dangers of misinterpretation and wishful thinking.

Most System/38 users questioned recently said they assume

*Continued on page 71*

# Motorola 68030 finds support

***General Automation announces system based on new chip; others to follow***

BY JAMES CONNOLLY
CW STAFF

ANAHEIM, Calif. — General Automation, Inc. recently became the first in what is expected to be a string of vendors to announce systems based on Motorola, Inc.'s 68030 microprocessor, which is Motorola's successor to its 68020 CPU chip.

A Motorola spokesman said General Automation is the first vendor to announce a system using the 68030 but that a group of OEMs and system integrators are expected to be on hand when Motorola officials next week make announcements related to the 68030. Motorola introduced the 68030 in September 1986 with claims that it would perform 8 million instructions per second, which is double the capability of the 3-year-old 68020 and rival Intel Corp.'s 80386.

The General Automation Zebra 8830 is the new high-end product in General Automation's line of Pick Systems Pick-based business computers. The vendor claimed that the 8830 supports up to 256 users, which is twice the limit of its previous high-end product, the Zebra 7820.

According to General Automation Chairman Leonard N. Mackenzie, the 8830 not only is the company's first 68030-based system but also is the first General Automation system to use intelligent Motorola 68010-based terminal I/O controllers. That feature, which was designed to minimize data contention in configurations with large numbers of users, allows 64 users to be supported by each I/O subsystem.

The 8830 is available with up to 16M bytes of memory and features disk controllers with look-ahead cache memory and support for up to 3.28G bytes of disk storage.

The 8830 will be available to end users, OEMs and value-added resellers in January at prices ranging from $215,000 to $350,000, according to General Automation.

The 68020 is used principally in Unix-based systems. Major vendors selling 68020-based systems include Apple Computer, Inc.; Convergent Technologies, Inc.; NCR Corp.; Unisys Corp.; Harris Corp.; NEC Information Systems, Inc.; Apollo Computer, Inc.; and Sun Microsystems, Inc.

# Subsystem makes AT a workstation

BY STANLEY GIBSON
CW STAFF

CUPERTINO, Calif. — Opus Systems recently announced a hardware and software subsystem that converts an IBM Personal Computer AT or compatible machine into a multiuser system or engineering workstation running Microsoft Corp. MS-DOS and Unix simultaneously.

The 220PM subsystem consists of a hardware board including the National Semiconductor Corp. 32332 processor and AT&T Unix System V, Release 3 with enhancements.

Offering 2 to 3 million instructions per second (MIPS) of processing power and 4M to 16M bytes of physical memory, the 32-bit system, embedded in a PC AT, was designed to run MS-DOS and Unix System V simultaneously.

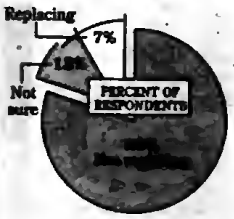
Opus referred to its product as part of its Series 200 of Personal Mainframes. "We are trying to say we are taking ad-

*Continued on page 70*

## Data View

No substitute

*Survey of 500 MIS shops shows few will replace IBM System/36 with IBM 9370*




INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

# Emulex adds 655M-byte disk

COSTA MESA, Calif. — Emulex Corp. recently heated up its competition with Digital Equipment Corp. and DEC-compatible disk makers by introducing a disk subsystem that Emulex claimed provides 1.7G bytes of storage per square foot.

The SM206, designed for use with DEC VAXs, is based on Emulex's Storage Module Interconnect and the recently announced Control Data Corp. 9720 EMD-850 Sabre IV 8-in. disk drive. According to Emulex, the drive is intended for applications in which capacity and performance are critical.

Up to 12 of the 8-in. drives can be packaged in a single 19-in. cabinet to provide up to 7.8G bytes of formatted storage. The drives are compatible with DEC's Digital Storage Architecture, according to Emulex.

Each drive has a formatted capacity of 655M bytes, a 16-msec average seek time and a 2.46M byte/sec. transfer rate, said Emulex Vice-President for Storage Product Unit Jay O'Donald. The SM206 is scheduled for shipment in November at a list price of $168,000.

**Inside**


- IBC adds 68020-based multiuser PC. Page 70.
- Delphax rolls out ion printer with raster image processing. Page 71.
- Unisys unveils terminals for Unix, Uniscope. Page 73.



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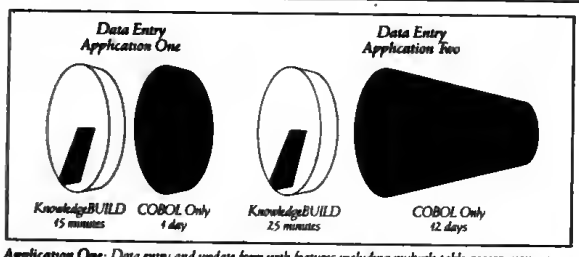


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## Subsystem

CONTINUED FROM PAGE 67

vanced technology and putting it in a PC form factor," said John Lundell, chairman of Opus.

The subsystems are to be sold to value-added resellers and systems integrators who will configure them with an AT for use as single-user engineering workstations or as multiuser systems supporting a maximum of 16 users in typical applications, according to the vendor.

Opus previously offered its 110PM, which is designed to work with an IBM PC XT or compatible or AT. A 220PM board may be swapped for the 110PM board in an AT in upgrading a 110PM system.

The 220PM more than doubles the throughput of the Model 110PM and improves floating-point calculation speeds, according to the vendor. Prior to the introduction of the 220PM, the price of the 110PM was cut by up to 48%, Opus said. Deliveries of three versions of the Model 220PM will begin immediately to OEMs, value-added resellers and systems integrators under volume discounts.

The 220PM-04 containing 4M bytes of random-access memory has a suggested list price of $3,995. The 220PM-08, an 8M-byte version, lists at $6,155. The 220PM-16, with 16M bytes of memory, lists at $9,755. The prices include a one-to two-user Unix license as well as Opus's real-time I/O executive and I/O device driver library.

# IBC offers Motorola 68020-based multiuser micro; I/O featured

BY STANLEY GIBSON
CW STAFF

CHATSWORTH, Calif. — Integrated Business Computers, Inc. (IBC) recently added a multiuser microcomputer based on the Motorola, Inc. 68020 microprocessor to its line of multiuser systems.

Using a 16-MHz version of the 68020, the Ensign 682:100 is capable of supporting from 16 to 100 users with a per-user cost of $484, according to IBC.

The key to the Ensign's multiuser performance is its intelligent serial and disk controllers, said Randy Johnson, vice-president of marketing at IBC.

The controllers, called IBC's proprietary Memory Management Unit (MMU), can use up to four Motorola 68010 microprocessors and more than 1M byte of buffer memory for serial and disk overhead, leaving the host 68020 free to provide its full performance to as many as 100 users, Johnson said.

A basic Ensign 682:100 configuration consists of a 16-MHz 68020, a 50M-byte Winchester drive, a 1.6M-byte floppy disk drive, 16 serial ports, a parallel port, a slave 10-MHz 68010 processor and a 1M-byte memory disk serial I/O buffer.

The suggested retail price of the product is $10,695.

A fully equipped Ensign 682:100 configuration supporting 100 users includes 24M bytes of random-access memory, 1.1G bytes of hard-disk storage, a 1.6M-byte floppy disk drive, 100 serial ports, four parallel ports, a Motorola 68881 floating point coprocessor, a 60M-byte streaming tape drive backup and AT&T's Unix System V operating system at a suggested retail price of $85,290.

In 1986, IBC introduced the Ensign 386:100, a multiuser system using the Intel Corp. 80386 microprocessor. IBC will generally sell the Ensign 682:100 and the Ensign 386:100 to different value-added resellers, according to Johnson.

However, users who wish to run both 80386- and 68020-based systems may purchase from IBC a 68020 adapter board that can plug into its 80386-based product. "It is for people who use Unix and Xenix. It saves money for users who can use it instead of buying two systems," Johnson said.

He added that IBC plans to offer a 20-MHz version of the 386-based product within two to three months.


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# Delphax ion printer boasts raster processing

BY SUZANNE WEIXEL
CW STAFF

RANDOLPH, Mass. — Delphax Systems, Inc., a manufacturer of nonimpact printing systems utilizing its ion printing process, recently announced the Delphax S3000G, an ion printer with a raster image processing subsystem.

The Delphax S3000G is a 30 page/min. printer that produces output at a matrix density of 300 by 300 dot/in. resolution. It is supported by a 3½-in. floppy disk drive that can be used to download fonts or emulations.

According to Naomi Luft, senior research analyst at Datek Information Services, the raster image processing controller is significant because it opens up ion printer technology to different applications.

"Traditionally, Delphax 30 page/min. machines have been used for internal documents and word processing applications. By offering this controller, Delphax can become involved in markets such as desktop publishing and general correspondence," Luft said.

"Since the print quality is a fair amount different from what users are accustomed to, it's mostly a matter of whether the market is ready to accept ion printing for different things," she added.

The raster image processing controller is located in a separate printed-circuit board within the printer enclosure. It provides emulation for the Hewlett-Packard Co. Laserjet Plus and Diablo 630 printer command languages. Standard interfaces for the S3000G include those from Centronics Data Computer Corp. and Dataproducts Corp. Delphax also offers custom interfaces for specific applications requirements.

The raster image processing motherboard contains an Intel Corp. 80286 microprocessor for local memory and self-diagnostic commands in addition to all-points addressability.

Company spokesmen said graphic enhancements designed to extend the HP Laserjet's capabilities include the ability to download up to six forms and create page designs with line, arc and circle-draw commands.

The S3000G ion printer is rated at a monthly duty cycle of 250,000 pages. Dual 500-sheet feeder and stacker bins are standard; 2,000-sheet feeder and stackers are available.

Delphax markets the S3000G ion printer to OEMs, but spokesmen estimated that end-user prices will range from $20,000 to $25,000. An upgrade kit for the S3000L ion printer, Delphax's earlier 30 page/min. model, is also available, the vendor said.

# Fighting

CONTINUED FROM PAGE 67

Silverlake will arrive next year and that their software will be supported. But few are confident that the early Silverlake models will exceed the power of the current high-end System/38 Model 700 or that enhancements to the Model 700 will be available to support those high-end users until high-performance Silverlake models are delivered.

The users also expressed concern about just how compatible their software will be with Silverlake and IBM's priorities. One user said he had heard through the grapevine that Silverlake will include RPG II as a standard feature and that RPG III will be available at additional cost. That might sit well with System/36 customers who have been using RPG II, but it obviously would not please System/38 users who run RPG III. Is that report true? The user has been unable to find out from IBM.

The irony of the System/38 users' situation is that they may be the most loyal of all computer user communities. MIS managers at System/38 sites have made a commitment to a non-mainstream architecture, a technology based from the start on the now-popular concepts of data base management and ease of programming. By IBM standards, the System/38 has never been a market smash hit, with a U.S. installed base of about 11,500 systems. But that number represents thousands of firms that have stuck with the System/38 through years of speculation about whether IBM would abandon them. It is not surprising that those users voicing concern are those with one, two or three CPUs, which is fairly typical of the System/38 user base. Also, few System/38 users get into the nondisclosure briefings that IBM gives to users of its 3090 mainframes.

However, is there any reason to believe that knowing the direction of IBM's mid-range strategy is any less important to a manager who uses a $250,000 System/38 as a host system than knowing the IBM mainframe strategy is to a manager running an $8 million 3090? Certainly not if both managers worry about things such as capacity, connectivity, compatibility and obsolescence.

If for no reason other than their loyalty, System/38 users deserve more than vague promises of something special coming a year down the road.

Connolly is *Computerworld's* senior editor, systems & peripherals.


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## NEW PRODUCTS

### Turnkey systems

A computer-based proprietary monitoring system said to combine fire, security and access control, has been introduced by **ADT, Inc.**

The system, called the **Centrascan 300**, features a desktop CPU that integrates such software applications as burglar and fire alarms, card access, watchman's tour, closed-circuit television and building management.

Available options include color graphics, map matrix status display, a remote terminal unit that functions as a communications interface between various points of protection and the Centrascan console, a second operator terminal and an uninterruptible power supply.

The Centrascan 300 is priced from $34,000.

ADT, 300 Interpace Pkwy., Parsippany, N.J. 07054. 201-316-1000.

### Processors

**A backplane central services module** has been announced by **Mupac Corp.**

The backplane plugs into the back of a Mupac IPSB backplane to allow the system designer to use slot zero. It provides such basic Intel Corp. Multibus II system functions as generating synchronous bus clocks for all Multibus II Parallel System Bus agents, monitoring time-out exceptions and asserting time-out signals when detected, assigning arbitration and card-slot IDs to each agent during reset of the system and automatic resetting.

The backplane is priced at $450.

Mupac, 10 Mupac Drive, Brockton, Mass. 02401. 617-588-6110.

### CAD/CAM/CAE

A Unix-based turnkey engineering workstation has been announced by **Graftek, Inc.**, a Unisys Corp. company.

The **Model 1450** uses Motorola, Inc. 68020 processor technology and includes a Motorola 68881 floating-point processor. The workstation is capable of functioning as a standalone unit or can be linked to form a network sharing such resources as data files, printers and plotters.

The Model 1450 incorporates an integrated graphics display offering up to 256 simultaneous colors, on-screen menu highlight selection, dynamic pan and zoom and three-dimensional rotation.

Software includes the vendor's GMS modeling software and such applications as numerical control, finite-element modeling, plastic injection mold design and analysis and relational data base management.

The Model 1450 is priced from about $50,000.

Graftek, P.O. Box 9014, 2970 Wilderness Place, Boulder, Colo. 80301. 303-449-1138.

### Data storage

An optical-disk controller board designed for Q-bus systems has been announced by **Qualogy, Inc.**

The **QLC-1000** optical controller, said to be completely compatible with Digital Equipment Corp. hardware and software, looks like a TK-50 tape drive to the Q-bus system using Tape Mass Storage Control Protocol.

Throughput is said to reach up to 250K byte/sec. The controller works with both 5¼- and 12-in. optical disks.

The QLC-1000 is a dual-wide-Q-bus board that uses a proprietary gate array, a NEC Corp. V50 microprocessor and 64K bytes of random-access memory cache. It costs $1,995.

Qualogy, 2241 Lundy Ave., San Jose, Calif. 95131. 408-434-5200.

An enhanced small device interface (ESDI) disk controller for VME-based systems has been introduced by **Xylogics, Inc.**

The board, called the **Xylogics 714**, is said to be capable of controlling four industry-standard or ESDI disk drives with configurations set by user software. Data transfer rates from 625 byte/sec. at 5 MHz to more than 1.8M byte/sec. are supported.

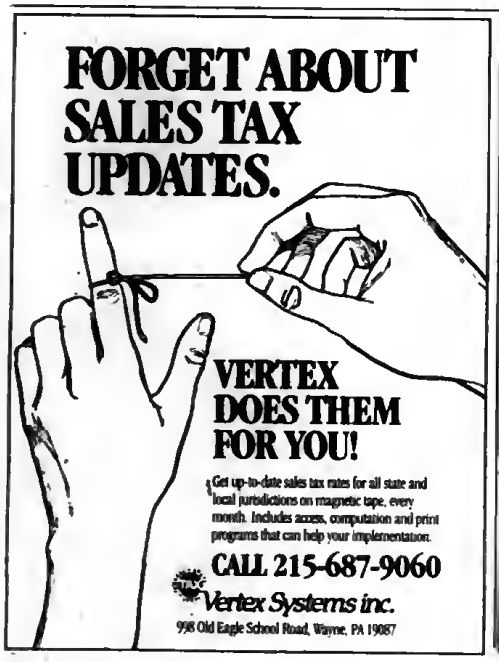
The controller features a 48-bit error-correction code, 32-bit direct-memory access and a 28K-byte first-in first-out data buffer.

The Xylogics 714 is priced at $2,695.

Xylogics, 53 Third Ave., Burlington, Mass. 01803. 617-272-8140.

A 500M-byte hard-disk subsystem for Hewlett-Packard Co. HP 3000 computer systems has been announced by **Bering Industries, Inc.**.

The **Model 5050** features an average transfer rate of 800K byte/sec. and an access time of 26 msec. It is said to be 100% compatible with HP computers using CS/80 and SS/80 com-

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mand sets. Self-diagnostics are included in the disk controller to automatically isolate failures.

The Model 5050 is priced at $12,500.

Bering Industries, 280 Technology Circle, Scotts Valley, Calif. 95066. 408-438-8779.

## Terminals

Three terminals for Uniscope and Unix operating environments have been announced by **Unisys Corp.**

Two of the terminals, the **SVT 1125** and the **SVT 1126**, were designed for use with Unisys's OS-1100 mainframe and support the Uniscope protocol. The SVT 1125 communicates over packet-switched public data networks. The SVT 1126 communicates over twisted-pair wiring. Both feature 14-in. monochrome displays capable of 80- or 132-col. viewing modes.

The **UVT 1224** is an ANSI X3.64 standard terminal featuring a 14-in. monochrome display offering 24 lines by 80- or 132-col. It is compatible with Digital Equipment Corp. VT52, VT100 and VT220 terminals.

The SVT 1125 and SVT 1126 each cost $895. The UVT 1224 costs $695 or $795, depending on the type of keyboard.

Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 215-542-2240.

**Identix, Inc.** has reduced the price of its **IDX-10** finger scanning terminal.

The IDX-10 is a compact terminal that contains a patented finger scanner and proprietary software for identity verification.

Up to 63 terminals can be connected to a specially configured IBM Personal System/2 host computer by a local-area network.

The IDX-10 was designed for such security applications as controlling access to facilities or computer data and authorizing business transactions such as electronic funds transfer, the vendor said.

The single-quantity price of the IDX-10 was reduced from $7,500 to $5,000.

Identix, Palo Alto, Calif. 415-858-1011.

**Courier Information Systems**, an Alcatel Business Systems company, has expanded its IBM 3270-compatible product line with three display terminals designed for data entry and interactive processing.

The **Courier 9291 G** green, **9291 A** amber and **9291 AG** amber-gold displays function as plug-compatible replacements for IBM 3191 A and B display terminals. They feature ergonomic, 12-in. tilt-and-swivel monitors and nonglare, 1,920-char. screens.

Other features include variable underlining, reveal mode, blinking fields, a row and column indicator, autoblank, security key lock and single-stroke clear.

The terminals cost $1,235 each with a one-year warranty and $1,295 each with a three-year warranty.

Courier Information Systems, 1515 W. 14th St., Tempe, Ariz. 85281. 602-894-7000.

A 12-in. monochrome monitor designed specifically for use by stock and currency traders has been introduced by **Electrohome Ltd.**

Called the **EVM-1220SL**, the 12-in. monitor measures 11.3 in. wide and 12½ in. deep. The actual footprint is 142.4 sq in.

The small size enables installation of up to six units, instead of five, on a trader's desk.

Resolution is 650 by 488 pixels, and the horizontal scan rate adjusts automatically to any signal between 15.75 and 25 KHz.

There is a choice of an antiglare or polished tube with white, green or amber phosphors. Sixteen discernible levels of black, gray and white can be displayed.

Pricing ranges from $677 to $777.

Electrohome, 809 Wellington St. N., Kitchener, Ont., Canada N2G 4J6. 519-744-7111.

A point-of-sale terminal family designed for the specialty store market has been announced by **NCR Corp.**

The **NCR Specialty Store System** is programmed in Basic. According to the vendor, one terminal can be used alone, or up to 32 terminals can be linked together.

The family consists of four models: the NCR 2157 and NCR 2155 are primary terminals that feature file sharing, and the NCR 2156 and NCR 2154 are secondary terminals that can share the resources of the primary terminal.

A basic terminal is priced at $4,600.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479. 513-445-4169.

## Printers/Plotters

**MAI Basic Four, Inc.** has introduced the **PT-4215** dot matrix, the **PT-4216** letter-quality and the **PT-4220** and **PT-4221** band printers.

The PT-4215 is a 24-wire dot matrix printer. Continuous forms are automatically loaded and unloaded. Single sheets can be loaded without removing the continuous forms. It costs $1,495.

The PT-4216 desktop daisywheel printer reportedly can accommodate single sheets and multipart forms up to 15 in. wide. It costs $845 with a parallel interface and $895 with both parallel and serial interfaces.

The PT-4220 and PT-4221 are band printers featuring six-digit display controls. They can accommodate up to six-part forms.

The PT-4220 is rated at 600 line/min and the PT-4221 at 1,200 line/min.

The PT-4220 costs $8,495. The PT-4221 costs $19,995.

MAI Basic Four, 14101 Myford Road, Tustin, Calif. 92680. 714-731-5100.

An 8 page/min laser printer designed for use with IBM System/34, 36 and 38 minicomputers has been announced by **Acom Computer, Inc.**

The **Treasurer LX3808** printer is said to emulate the IBM 5219 and 5225 printers when addressing the IBM minicomputers; it emulates the Hewlett-Packard Co. Laserjet when addressing personal computers.

Features include a built-in sheet and envelope feeder as well as support for one minicomputer and up to three personal computers. Software compatibility is provided for such programs as Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase III and Microsoft Corp.'s Word.

The Treasurer LX3808 is priced at $4,495.

Acom Computer, 3534 Atlantic Ave., Long Beach, Calif. 90807. 213-424-986.

**Datasouth Computer Corp.** has announced a price reduction on its **TX 5180** printer designed for use with the IBM System/34, 36 and 38 minicomputers.

The TX 5180 is said to print LAC/APF graphics and to provide multiple pitch options. It is also compatible with the IBM Displaywrite/36 and Text Management word processing programs.

The TX 5180 is plug-compatible with the IBM minicomputers and features a parallel interface for ASCII computers as well.

Pricing for the TX 5180 has been reduced from $2,995 to $1,995.

Datasouth, P.O. Box 240947, Charlotte, N.C. 28224. 704-523-8500.

## Input devices

**Eastman Kodak Co.** has introduced the **Kodak Ektaprint 1530 scanner** designed for use with its Kodak Ektaprint electronic publishing system.

The 1530 scanner, which is driven by proprietary software, allows cropping and manipulating images. It also provides a 75 dot/in. lower resolution preview scan for developing rough layouts.

Images can be scaled and adjusted by the scanner itself.

Available options include six dithering screens and the ability to mirror or reverse images. Users are also able to divide images in order to apply image-capture techniques to individual segments.

The Kodak Ektaprint 1530 scanner starts at $6,000.

Eastman Kodak, 343 State St., Rochester, N.Y. 14650. 716-724-1336.

A computer system said to simplify the entry of base maps into an electronic data base for revision, printout and storage has been announced by **Xerox Corp.**

The **Xerox Pro Scan System** allows operators to use a scanner to enter plats in raster form. Additions and deletions to the record are then entered as vector data, which can be indexed and manipulated electronically.

According to the vendor, a D-size 36- by 48-in. document can be scanned into the system in about 45 sec.

The system includes a Xerox 2285 19-in. color workstation, Unix-based Pro Scan software, a high-resolution scanner and an electrostatic plotter.

A fully configured system, including training for one operator, costs about $125,000.

Xerox, EDDS, P.O. Box 2000, Leesburg, Va. 22075. 800-832-6979.

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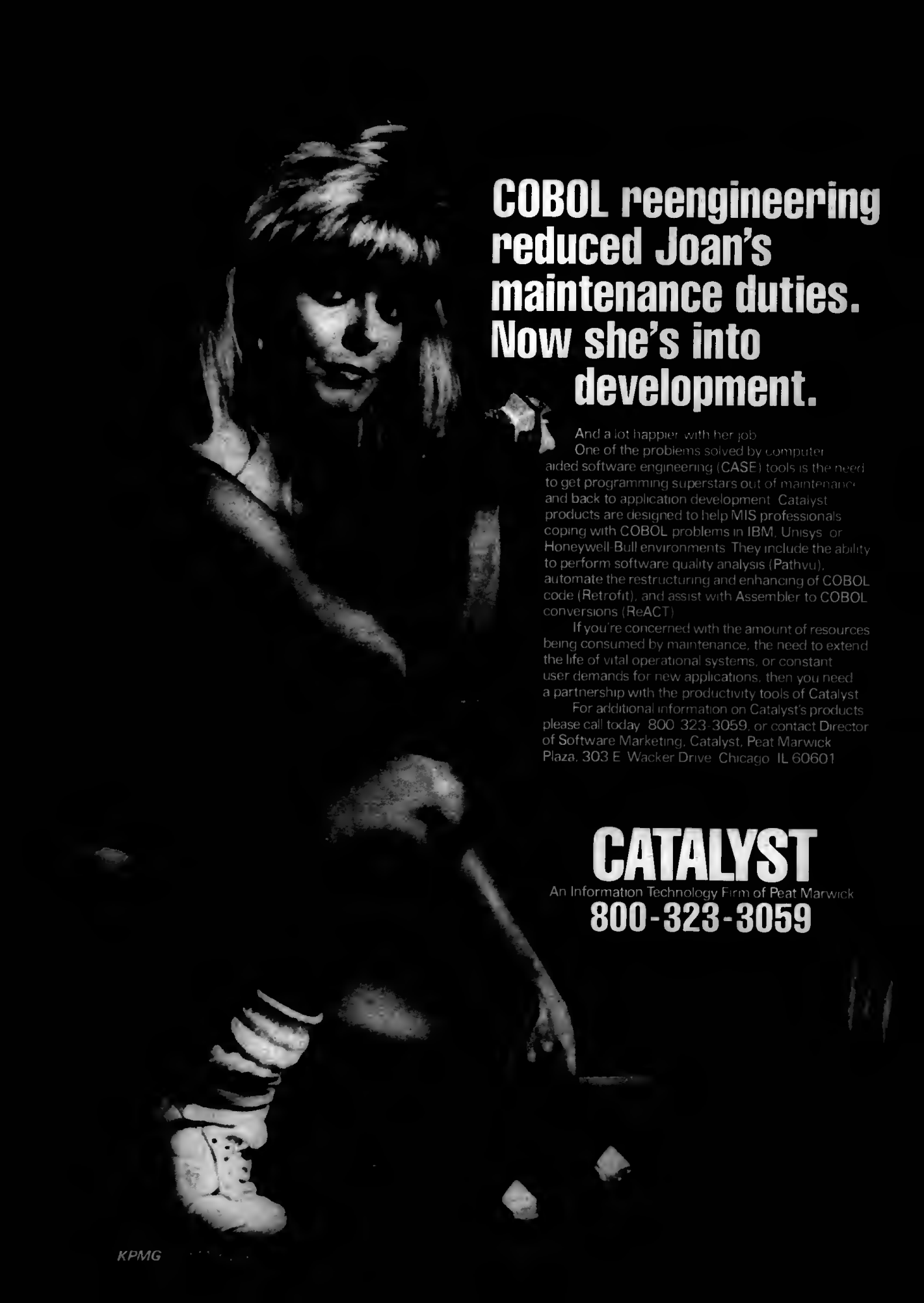
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# What threatens mainframe computing?

*Only the culture still requires 'serious computing' to be run on a central machine*

BY FRED VISKOVICH

Is the mainframe dead? The answer is no, the mainframe is not dead. Not now. But it is dying, and the implications of its inevitable death are profound and far-reaching.

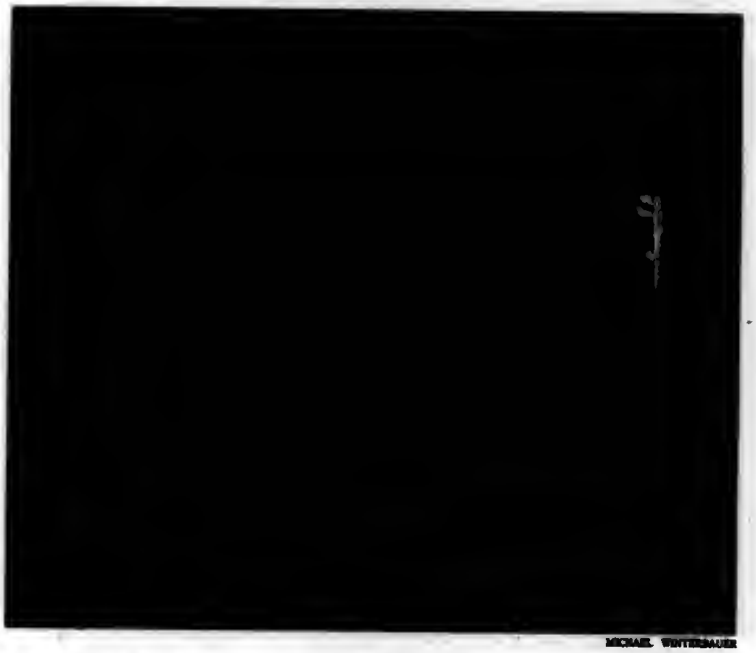
As with any recognition of mortality, there are phases of denial and rejection to pass through before acceptance finally comes about. For example, the recently introduced IBM Personal System/2 products have been described as a way to reintegrate personal computing and at the same time invigorate IBM's mainframe business. But they are not. They will only hasten the death of the mainframe, a process that was given significant impetus by the introduction of the IBM Personal Computer in August 1981.

The PS/2 will further demonstrate the superiority of a wide range of technologies, from non-mainframe operating systems to user interfaces to networking.

The PS/2 is an indication that IBM realizes the mainframe is vulnerable and approaching an evolutionary dead end. Talk of PS/2 mainframe connectivity is simply part of a tactical transition plan that protects customer investment, defends against computing chaos and preserves the expected profitability of America's fourth largest industrial corporation.

Before we further consider its demise, it is important to clarify what we mean by "mainframe."

Viskovich is a manager in the information systems group at Coopers & Lybrand in Philadelphia.



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When we say "mainframe," we refer not only to a class of computing machinery but, more important, to a corporate computing technology paradigm.

In his seminal work on the philosophy of science, *The Structure of Scientific Revolutions* (University of Chicago Press, 1962), Thomas S. Kuhn defined "paradigm" as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners."

Thus, when we say "mainframe," we designate a paradigm, an idea that represents the current orthodoxy of just how serious, responsible computing should be carried out. In our idea of the mainframe, it is as much a creature of corporate culture and the organizational chart as it is electronics and integrated circuits.

This distinction between idea and object is significant. It is the mainframe's role as corporate information processing paradigm that justifies its existence and prolongs its life — not technical demands for computing capability that cannot be satisfied by other means.

### Control of computing

Corporate culture dictates that computing as a valuable, enterprisewide activity be directed through the established command-and-control apparatus of the corporation. Examples of such systems include airline reservations, shop floor control, production scheduling, automated teller machines, electronic

- **Mainframe paradigm grows obsolete**
- **Corporations' need for central control fades**
- **In crisis, mainframers rally around**

funds transfer, credit validation, sales order entry, financial information reporting, payroll, materials management, inventory control, accounts payable and receivable, billing and customer information.

In this scenario, the MIS organization is the corporate command-and-control unit directing serious computing. This includes computer operations, programming and automated information archival. Historically, the MIS organization had one computer to deal with: the mainframe. Consequently, the very concept of serious computing became intimately linked with the mainframe.

However, it is important to realize that it is corporate culture, not the nature of the processing itself, that promotes the need to do all serious computing in one mainframe computer.

The millions of instructions per second (MIPS) only have to be in one place so that the perceived span of control is not overextended. MIPS do not have to be in one place to handle high-volume transaction processing or achieve subsecond response time.

The mainframe is synonymous with this high-volume computing requirement only when the corporation's generalized management philosophy and control sanctions uncritically extend to computer systems management.

### Mainframe problems

Along with the corporate idea that central mainframes housed in a computer room are the only way certain applications can be developed are a number of broad-based problems, including applications backlog, performance reliability, capacity planning and chargeback.

Each of these problems contributes in its own way to the impending death of the mainframe.

The most notorious mainframe problem is the application backlog. In some cases, development work is complex by its very nature and should not be attempted without painstaking review and caution. There are also special barriers to rapid development in a mainframe environment, namely division of labor, low-level interfaces and testing.

In terms of division of labor, there are simply not enough qualified, competent mainframers. The support for a mainframe environment requires a fairly precise division of labor. In the past, managers, programmers, operators, production control staff, tape librarians and other support personnel were required. Today, we also need data modelers, analysts and administrators, data communications and networking specialists, information center managers and application source coders. We need individuals with integration talent, enterprise knowledge and the interpersonal skills to facilitate the corporation's common interests.

This increased specialization diminishes the available labor pool relative to demand, driving up costs and contributing to destabilizing competition for resources. Anyone who knows anything is considered an expert and is coveted by the competition, even if possessing a relatively shallow knowledge of complex and robust software.

The situation is not improving. At the same time personal computers are being made mandatory for students, colleges are experiencing declining enrollments in MIS programs. Finally, on-the-job training is stifled in the large, complex mainframe environment. Trainees can hardly be given access to play with the mainframe.

In short, development cannot be accomplished rapidly because there is no one there to develop.

### Low-level interfaces

When someone *is* there, even the best developer is hampered by poor tools. Over the years, this has been exacerbated by an obstinate commitment to "absurdly low-level" interfaces to application development facilities, to borrow E. F. Codd's phrase.

There has been some relief with fourth-generation language products, but this is largely too little, too late in terms of saving the mainframe.

For one thing, the productivity gains of fourth-generation languages are reduced by the even more appalling paucity of fourth-generation practitioners, questionable performance and the largely idiosyncratic nature of the proprietary fourth-generation languages. In addition, even the best mainframe interfaces pale next those offered on PCs.

Once a developer masters the interfaces, he must still negotiate formidable test environments: *My* testing can imperil *your* production and vice versa. This is primarily because one application shares the same hardware and the same set of systems-level software with many other applications in a single-image mainframe processor that is not nonstop. Defects in a single application can knock out the multiple application support provided by "condominium software" such as IBM's CICS transaction manager and data communications monitor.

Testing has to be quarantined from production or, worse still, production facilities will be polluted with test transactions and facsimile data. Introducing multiple production copies of the transaction manager software provides some relief, as does the creation of virtual test machines, but at the expense of a more convoluted production environment. In the end, there is only a physical machine image that must be managed.

During and after testing — to be consistent with mainframe division of labor — business applications programmers must coordinate with systems programmers, who appropriately configure

the above applications support software. Often, a separate systems acceptance group performs final production testing and further coordinates a production control group that moves final draft code into production libraries.

All of the preceding adds an enormous amount of time to the application development cycle. In many cases, testing is given short shrift in a desperate effort to accelerate application development.

### Reliable performance

The continued attempt to provide a safe proving ground for software essentially divorces such testing from the final production environment — eventually to the detriment of application performance.

The performance profiles specified by end users — the preferred analysts — early in the development life cycle are terribly difficult to achieve in the mainframe environment.

End users are often naive about, if not completely oblivious to, the capabilities of the underlying technical environment. Even business application programmers cannot easily predict the effect new production systems can have on old production systems. Again, as a result of division of labor, they are largely unaware of overall system contention and of what natural avenues exist for achieving higher performance through systems software features and tuning.

Systems programmers, on the other hand, are notoriously unsympathetic to using a mainframe for much more than running the operating system.

**APPLICATIONS are more often considered failures by virtue of bad performance than because they lack comprehensive features or a slick user interface. Ask the New Jersey Division of Motor Vehicles.**

In a best-case scenario, a technically enlightened designer is still faced with the fact that the exact impact of new programs on the simultaneous operation of old ones requires elaborate modeling. Such modeling must take into account transaction volume and variation, processor speeds, instruction mix, interruptions, disk access, communications delays and hundreds of smaller scale issues. This kind of modeling is really not done today, and, therefore, the true impact a new system has on the others can only be assessed at a gross level.

The risk ramifications of this can be critical. Applications are more often considered failures by virtue of bad performance than because they lack comprehensive features or a slick user interface. Ask the New Jersey Division of Motor Vehicles. No one could simply model the operation of New Jersey's latest registration system and then competently predict and avert the now infamous system start-up paralysis.

### Capacity planning

In the absence of modeling, the amount of mainframe power needed to operate a new application in a satisfactory manner is still a matter for informed conjecture and professional gut check.

Furthermore, the intended system benefits might not justify adding the next marginal increment of computer power. After all, we buy additional instructions per second by the millions, not one by one. The street-smart MIS executive buys mainframe power with a substantial slush factor, builds the new application, measures impact and then orders additional slush factor as soon as the next mainframe model upgrade is available.

In practice, this works to a certain extent. But the imprecision of slush factor-based capacity planning can often result in only subhour response time when subminute response time is required. It can also result in spending good money on unnecessary hardware capacity.

Despite the potential sophistication of capacity planning in large, well-endowed shops, formal empirical capacity planning is not practiced by the majority of data processing organizations. At best, it is practiced for them by hardware vendors.

### Chargeback

The cost of mainframe operations is usually applied to end-user organizations through chargeback algorithms. Chargeback and the computing utility's rate-making are often no more warmly received than the rate-making of its local electric and gas counterpart.

As fair, rational and equitable as chargeback may be if it is done correctly, line managers often have trouble understanding why they are charged what they see as exorbitant rates for service.

Chargeback is a frequently misapplied and artificial process that does not promote the intelligent, cost-effective use of computing. Rather, it serves as a disincentive that precipitates renegade computing through clandestine personal computers, minicomputers or expensive time-sharing services.

### Mainframe alternatives

If, beset with the preceding problems, the mainframe is dying, what keeps it alive, and what impedes the acceptance of plausible alternatives?

Why hasn't the onslaught of critical literature issued in the last decade dislodged

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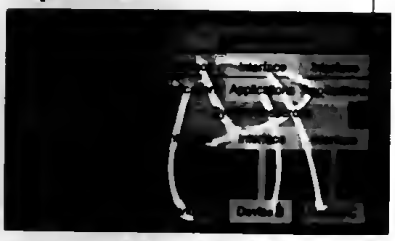

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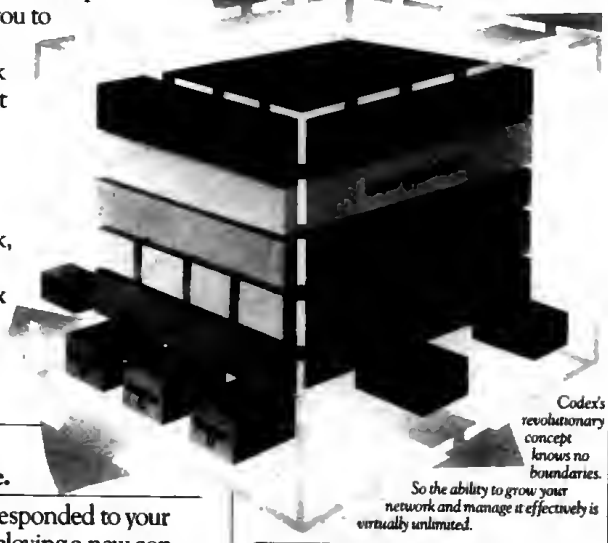

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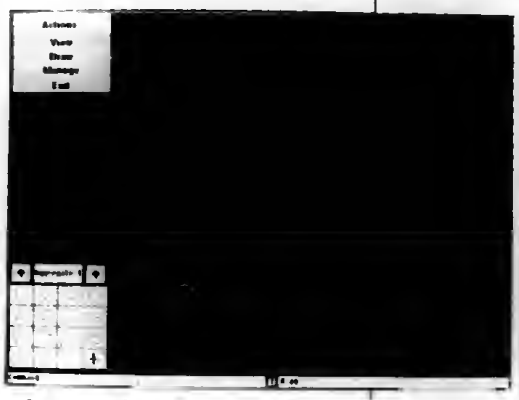

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the MIS community from the mainframe computing paradigm?

No one seriously debates the evidence of crisis. In fact, if anything, exaggerations and specious notions like the "hidden" applications backlog abound and are given great credence. Why does mainframe computing, despite severe assault, hang on and dominate the thinking of MIS professionals?

One answer lies in the observations I made earlier. The mainframe is not just an object of technology. It is a corporate information processing paradigm. It is the presumed medium for expressing serious commercial computing solutions.

The mainframe is a part of corporate culture. A change in culture is much more difficult to effect than a change in technology. Thus, the frustrated carpenter blames his tools, not his craft. The current fourth-generation language obsession is an attempt to get rid of guilty tools, not wood.

A change in culture necessitates a transformation of world view. The mainframe crisis has been going on since the late 1970s, yet no one has ever reached the conclusion that the very nature of the mainframe and mainframe computing is the cause of the problem.

The situation is analogous to a paradigm shift in the scientific world. Quoting again from Kuhn, "The act of judgment that leads scientists to reject a previously accepted theory is always based upon more than a comparison of that theory with the world. The decision to reject one paradigm is always simultaneously the decision to accept another, and the judgment leading to that decision involves the comparison of both paradigms with nature and with each other."

### Mainframe defense

The corporate mainframe establishment, from chief information officer to data entry clerk, does not reject the mainframe paradigm because of indications the paradigm is in crisis. Confronted with crisis, mainframe users rally to the mainframe's support. They first modify it, then extend it, virtualize it or otherwise patch or fix it. The ardent mainframe advocate retrenches with each mainframe upgrade announcement and sandbags anew with more MIPS, more coupled processor architectures and more operating system releases.

The corporate computing culture and the natural conservatism of the command and control apparatus predisposes MIS to avoid serious consideration of other solutions, preferring to simply dismiss nonmainframe alternatives as inappropriate. Consequently, mainframe adherents deny the feasibility of nonmainframe paradigms by defending the mainframe on the "objective" grounds that it is a superior problem-solving machine.

One way or another, the mainframe is defended. The defense is twofold. Mainframes are needed for power, and they are needed for control. Mainframe power and control are correlatively listed as a requirement for serious mainframe applications — as opposed to other kinds of nonmainframe and, presumably, nonserious applications.

But while the equivalent of mainframe power may be needed by banking applications, utility industry applications or generic financial management applications, it cannot be technically demonstrated that there is such a thing as a "mainframe application."

> THE MAINFRAME crisis has been going on since the late 1970s, yet no one has reached the conclusion that the very nature of the mainframe and mainframe computing is the cause of the problem.

Mainframes are not the only computers or the only processor topology that can deliver the computing power, throughput and control necessary to implement serious, enterprisewide, bet-the-business production applications and strategic information systems. It cannot be shown that IBM's mainframe 370 architecture, as opposed to some other, is uniquely designed to support these applications.

### Application-neutral

To begin with, the machine language of the general-purpose IBM 370 commercial mainframe family is application-neutral — there are no instructions at a high enough language level to clearly support a recognizable business function.

There are no instructions such as "OPACCT" — open demand deposit account — or "POSTPUB" — post the paid utility bill — or "DOBALSHT" — do the balance sheet.

The machine languages of the IBM 3090 mainframe and the IBM Personal System/2 Model 80 perform the same primitive functions of logically or arithmetically adding and subtracting, testing for conditions and interrupting execution to go somewhere else to do something else.

Secondly, there are no machine instructions that perform these primitive functions any better materially in the one processor than the other. Mainframes offer direct support of data types such as packed, binary-coded decimal, numeric data and instructions to move large pieces of data elegantly from one memory to another. This advantage is largely nullified, however, by the fact that even software


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|---|---|---|
| [illegible] Fall-Back Speed | 7200 | [illegible] |
| Installed base | [illegible] | [illegible] |
| [illegible] of stored phone numbers | 9 | 4 |
| [illegible] industry standard MNP | yes | no |
| # of compatible MNP modem vendors | 40+ | 0 |
| Supports CCITT V.29 FT modulation | yes | no |
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internals programming is turning toward higher level, third-generation, compiler-based languages like C.

Nevertheless, assembly language coding for the Intel Corp. 80286 and 80386 processors is actually more powerful and more consistent with structured programming constructs than the 370's assembly language.

In short, the machine languages of mainframes and microprocessors are equally applicable for serious applications. Other areas to examine include processor speed, memory, throughput and control.

**CURRENT PS/2 products rival existing mainframes and equal or dwarf the mainframes of about eight years ago.**

**Processor speed.** The processing rate of the PS/2 Model 80 has been quoted at 2.88 MIPS. The current IBM 4381 Model 22 is quoted at 3 MIPS. Yesterday's 370/168 Model 3 — really big iron, circa 1976 — was about 2.5 MIPS. Today's big iron, an IBM 3090 Model 600E, weighs in at 76 MIPS. Thus, current PS/2 products rival existing mainframes and equal or dwarf the mainframes of about ten years ago.

The typical retort to these observations is that microcomputer MIPS are not the same as mainframe computer MIPS. The myth is that microcomputer MIPS are inferior and lower grade. However, there is nothing to support this retort. As stated above, there is no substantial, quantifiable difference between 80386 machine instructions and 370 machine instructions. An analysis yields only that MIPS measurements, which are admittedly imperfect, are still quite comparable and that mainframes are not the only source of MIPS power.

**Memory.** The other key indicator of a computer's power is memory. A computer must have data in memory before it can process it with the primitive machine instructions described above. The more memory it has, the less time has to be spent shuffling data back and forth to much slower secondary-storage devices such as disks.

The IBM mainframe architecture allows for the direct addressing of 2G bytes of memory. The 80386 microprocessor architecture allows for the direct addressing of 4G bytes of memory. In uncluttered terms, with no reference to virtual or expanded memories, an 80386 chip in long linear-address mode supports twice as much directly addressable memory as an IBM 3090.

**Throughput.** Some mainframe defenders will acknowledge the processing speed and memory of microprocessors such as the 80386. What they counter with is that mainframes boast throughput while minis and PCs do not.

"Throughput" describes a real-world, wall-clock time view of computer work. In the IBM Data Processing Glossary, it is "a measure of the amount of work performed by a computer system over a given period of time, e.g., jobs per day."

Computers perform work by executing primitive instructions on data that is resident in internal storage areas or in memory. If mainframes offer no special advantage in the execution of instructions or the ability to store data in memory, then where does the special mainframe throughput come from?

Disciples point to the channel capability of mainframes. Channels truck data from storage devices to memory. The mainframe does not do I/O per se, nor does it physically contain all of the mainframe data. Instead, data is physically distributed on storage devices that must communicate with the mainframe through channel intercession. The channel communicates independently with controllers that communicate with the actual devices that finally do the I/O. The channel then streams data into mainframe memory, interrupting mainframe operation to communicate that the requested I/O operation was completed.

Compare a mainframe fueled by obedient robot-like channels

with a network of cooperative intelligent workstations, PS/2 devices can be linked through Micro Channel facilities and local-area network (LAN) products that run from 4M bit/sec. IBM Token-Ring networks to 10M bit/sec. Ethernet networks. Other LANs of 80M bit/sec. are on the market.

Furthermore, devices are now available that permit operation across telephone companies' T3 circuits at channel speed. Ford Motor Co. is using this capability to link mainframes to peripherals six miles away.

Throughput, the darling of mainframe defenders, is largely a function of the transfer rate existing between the requesting data processor and the releasing data manager. The extent to which nonmainframe networks approach an overall data transfer rate of mainframe channel speed is, to a large degree, the extent to which they possess mainframe throughput.

Finally, the throughput issue is contingent on the premise that during a transaction session, computers constantly write and rewrite data to their final nonvolatile data storage resting place. When mainframes had 64K bytes of storage, this premise held true. But when large working sets of data are brought into the memory all at once for processing, the impact of the I/O data transfer rate on overall throughput is greatly reduced.

**Control.** The mainframe cannot be defended on the grounds that it has a unique kind of superior, technical problem-solving power. But does it offer superior control characteristics? Even if networks of high-performance PCs can rival mainframe system throughput and economics, data is scattered all over the network at each file server or, worse still, at each workstation.

With the mainframe, we know where the data is. It is in the computer room, and we can assume it is the most current enterprisewide version — the real version. We can have multiple users updating this single master version and making consistent reference to it.

**MAINFRAME computing is a cultural pillar sunk deep into 30-year-old data processing bedrock.**

Control is imposed through the natural bottleneck that a single mainframe computer causes. However, control is a logical idea, not a physical one. The goal is to have a seamless single image of the information resource, managed as a corporate asset, but not necessarily deserving of one repository any more than a corporation needs to have all of its cash in one bank.

There should be one exacting reference to information states, but this need not, and really should not, be implemented with one physical component. Besides the inevitable performance penalty, doing so is akin to putting all of one's eggs in one basket.

The intelligent distribution of information — and information about the information — through a network actually improves both control and performance. The technology is available to provide a distributed dictionary that will seek out and find where information is stored across a network and transparently present it to the business application system.

**New paradigm**

Despite the preceding observations, which call into question the primacy of mainframe power and control, the mainframe paradigm of computing will not die tomorrow.

As stated, the mainframe does not survive primarily because of arguments that demonstrate superior problem-solving ability vis-a-vis the newfangled, "anemic" corporate personal workstation technology of PS/2 products. Mainframe computing is a cultural pillar sunk deep into 30-year-old data processing bedrock.

The following, again from Kuhn, should illuminate our near-term assessment of the cogency of direct arguments on behalf of nonmainframe computer alternatives.

"Paradigm debates are not


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really about relative problem-solving ability, though for good reasons they are usually couched in those terms. Instead, the issue is which paradigm should, in the future, guide research on problems, many of which neither competitor can yet claim to resolve completely.

"A decision between alternate ways of practicing science is called for, and in the circumstances, that decision must be based less on past achievement than on future promise. . . . A decision of that kind can only be made on faith."

Faith is a tough sell in a competitive world. An unbiased assessment of nonmainframe technology paradigms in the context of carefully executed systems planning is somewhat easier.

But what is the new nonmainframe paradigm? At least in part, it is the PS/2 line of personal computers.

**Building a base**

These machines and their successors will constitute the basis for high-performance, personal workstation networks in corporations. These networks, based on peer-to-peer distributed relational data base technologies, will support serious office information systems that will replace business applications based in mainframe computer rooms.

It is important to understand the true capabilities of corporate-use personal workstation devices. Progress in understanding and implementing this new paradigm is constantly thwarted by myths that distort the extent to which mainframes offer power and control advantages over nonmainframes. Progress is also plagued by revisionist theories of mainframe connectivity. Mainframe connectivity offers nothing more than a turbo-charged version of dumb terminal dependency, not a viable plan for eliminating mainframe pathologies such as applications backlogs.

However, a strategic assessment of nonmainframe capabilities cannot be successfully conducted on the basis of simply comparing existing products. Sound strategic technology commitments can only be reached through structured systems planning.

Such planning should produce a technology architecture; that is, a model of the future information processing hardware, software and data communications infrastructure.

**Technology with vision**

It is absolutely critical that the technology architecture phase of systems planning is not unreasonably constrained by constant reference to what currently exists in the data processing marketplace. Because it is a model, it does not presume that all of the pieces are immediately available. And it does not answer all of the questions regarding how the pieces will fit together.

The planning process should come up with a future, end-state technology architecture that rationally looks beyond the product offerings of the day and determines a prospectus of future strategic technology directions. In that way, technology can be acquired when it truly is a competitive weapon, with eyes open to the attendant risks of being an innovator.

Finally, systems planning is essential because the timing of the transition to the nonmainframe paradigm will in many cases be conducted on a project-by-project basis. Each project can be conducted and each application built with the best technology available, with an eye toward near-term improvements. Gradually, with each project success, organizations will embrace the new paradigm more regularly and naturally.

In summary, there are no "mainframe applications." Although the assimilation of this fact into the collective consciousness of information processing will proceed at a glacial pace, it will ineluctably occur. It is not unlike paradigm shift in science.

The way to move forward in a prepared and productive way is to preface individual paradigm shifts within the enterprise with a thoroughgoing systems planning exercise that stresses the creation of an end-state technology architecture using modeling techniques.

The best time to do this is now — while the mainframe is still alive. •

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# You are what you do

*As surely as television, the computer socializes people into patterns of interaction and behavior*

BY TIM LYNCH

What toll does the forever onward press toward automation exact on the human psyche? In our efforts to computerize society, the potentially harmful psychological costs to humans must be weighed against the benefits provided by using intelligent machines.

Enter a new area of psychology — robopsychology. Coined after Isaac Asimov's term in his book, *I, Robot*, robopsychology examines how people cope with computers on a psychological level.

Just as we should not automate without considering the financial impact on a business, we should not computerize without taking into account the impact of such automation on humans.

The computer, like all major technological innovations, has had a profound effect on society. As surely as television, the computer socializes; it teaches us patterns of interaction, behavior, social norms and thought processes.

To study the impact of computerization on society, I conducted a qualitative research study in which 60 Massachusetts-based Unix programmers were interviewed. The interviews were executed by "Sigmund," an artificial intelligence program running on a Digital Equipment Corp. mainframe.

The study focused on three areas: the subject's relationship with the computer, the subject's interpersonal relations and how the subject perceives the computer's impact on himself and others.

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The study results show that the patterns of human interaction are changing in ways that directly relate to the way that we interact with computers. Our views of humans and our expectations of human interpersonal relationships are being altered by our use of the computer, as are our patterns of work and thought.

We are being shaped by the computer, and it is important to recognize these changes if we are to control them — to mitigate their ill effects and enhance the good ones.

### Interaction patterns

For example, every time we use a computer, it teaches us a pattern of interaction. We are forced to use the machine in a very precise, emotionless manner, using specific words in a regimented, predetermined order. If we veer from the proper interaction style, we get an error message and must correct our failed interaction in order to accomplish our goals.

To use the computer effectively, therefore, we must accommodate ourselves to the world of the machine.

This is not true of any other tool in society. We do not think like a hammer in order to put a nail in the wall. To use a computer, though, we must adjust our thought patterns to that of the machine.

The only other activity we engage in that requires using similar adjustment skills is dealing with humans. We, like computers, have certain rules of communication that must be followed if we are to accomplish our goals and reach an understanding with others.

### Learning by doing

Socialization — a basic principle of psychology — is the process by which we learn the rules of effective communication. Socialization forms a society's foundations, teaching people to accomplish goals in a socially acceptable manner.

The usual method of learning these norms and patterns is through interaction. We learn by doing. Through socialization, we learn to be human.

However, technology also socializes us, because people tend to generalize what they learn. That is, they apply previously learned patterns of interaction to a broad range of situations.

Furthermore, my research shows that the interaction patterns learned by using the computer can carry over to interpersonal interactions. To varying degrees, depending on usage and level of sophistication, many computer users communicate with and relate to people the same way they interact with their intelligent machines.

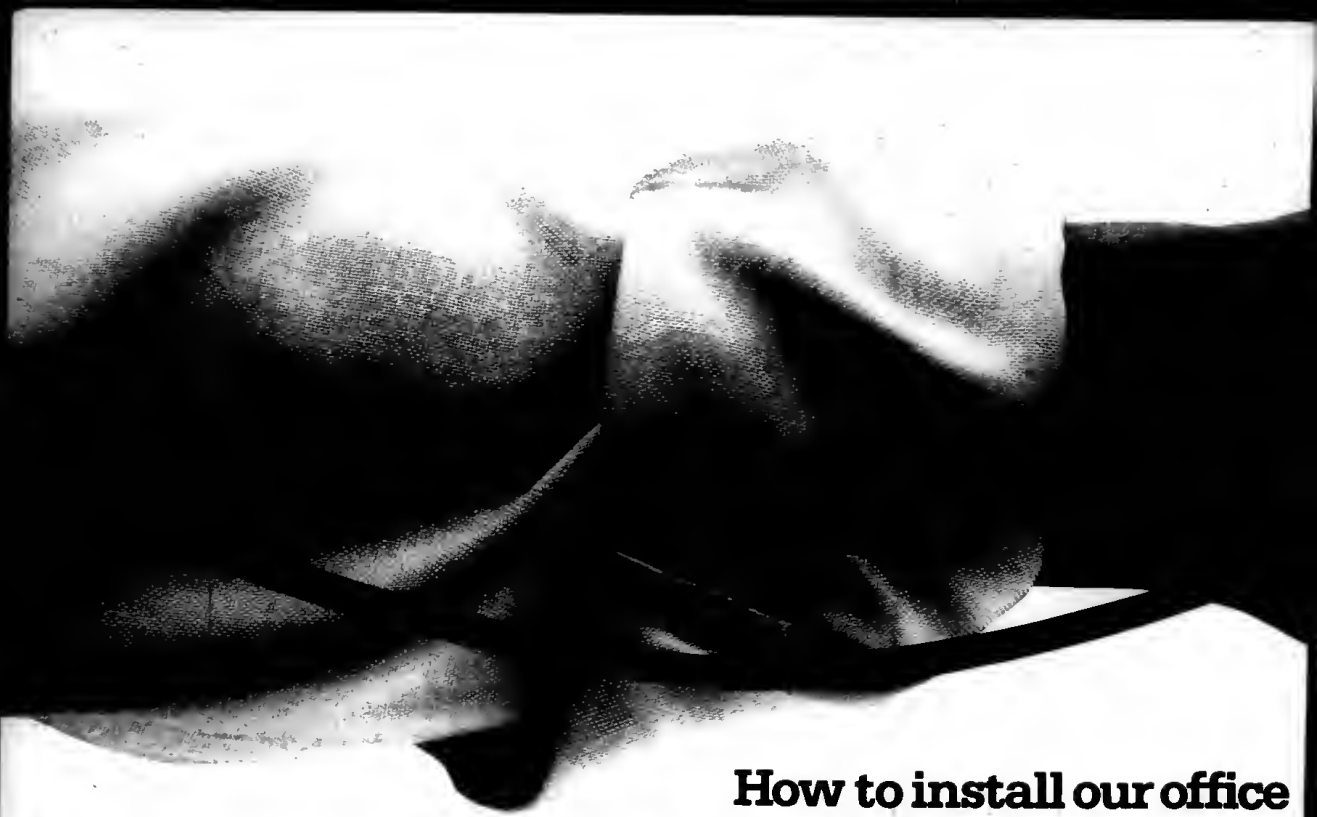
In other words, the more involved with the computer a user becomes, the more his behavior reflects that of the machine. The heavy user begins to crave logic and order in all things, especially human relations. He expects relationships to proceed directly from the initial meeting to a deep, interpersonal phase. For him, the ideal relationship consists of intense intellectual discussions but is devoid of emotional intensity, mirroring the interaction patterns he has with his computer.

### Programmers prey

Programmers, whose jobs are fraught with a high level of intensity and a regimented style of interaction, fall prey to the computer's adverse effects more

Lynch is president of New Wave Consultants in Quincy, Mass., and the first robopsychologist. He consults and researches in the psychology of human-to-computer interaction and its effects on the personality and interpersonal relations. He received his doctorate in humanistic psychology from Boston University.

- **Study shows users picking up PCs' habits**
- **Programmers affected most**
- **Little sleep, no food, great expertise**



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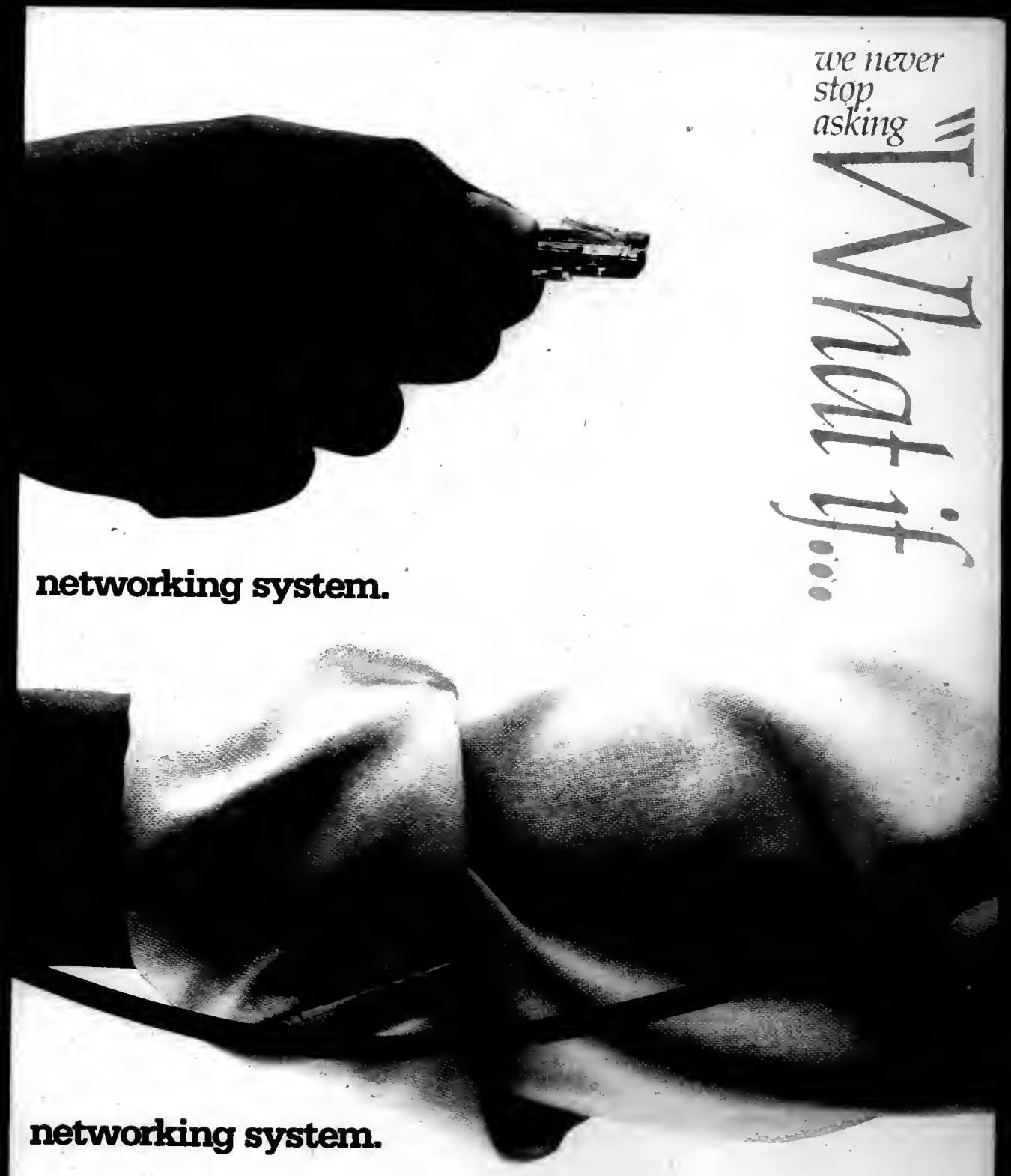


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often than any other type of user.

The 60 programmers I interviewed have spent at least five hours every day for the past seven or eight years at their machines. But, more tellingly, when in the midst of a project, these programmers routinely spend intense sessions of two or three consecutive 12-hour days working at the computer.

As a result of being what I consider overly involved, they all exhibit certain characteristic patterns of behavior that mimic their interaction patterns with the computer.

For example, those who are extremely involved with the computer expect the pace of interpersonal relationships to be faster than is normally acceptable. Overly involved computer users expect the speed with which a relationship develops to match the machine's pace: to be very fast — almost instantaneous — but also deep and intense.

### Instant gratification

A case in point is the person who expects instant satisfaction for his problem. One programmer I interviewed told of going to his sales department, walking directly into the manager's office and demanding that his friend, who owned a computer store, get copies of the new software he was developing before anyone else did. He just walked in without knocking and stated, "Send my software to Fred right away," and left.

Similarly, many fellow psychologists report that computer professionals have gone to see them and demanded that their problems be resolved in a single one-hour session.

With the computer, a worker engages in immediate, intense interaction. This pattern too often carries over into the intense computer user's interpersonal life, causing him to bypass customary societal niceties and to plunge directly into rather forward behavior upon making a new acquaintance.

Such behavior can obviously cause problems for a company. Work is a social, as well as a production, process. If some employees expect interpersonal relations to proceed at warp speed, it will be upsetting to those accustomed to a much slower pace. Miscommunication can result, causing problems in the development of new products or in establishing the team spirit vital for a well-functioning company.

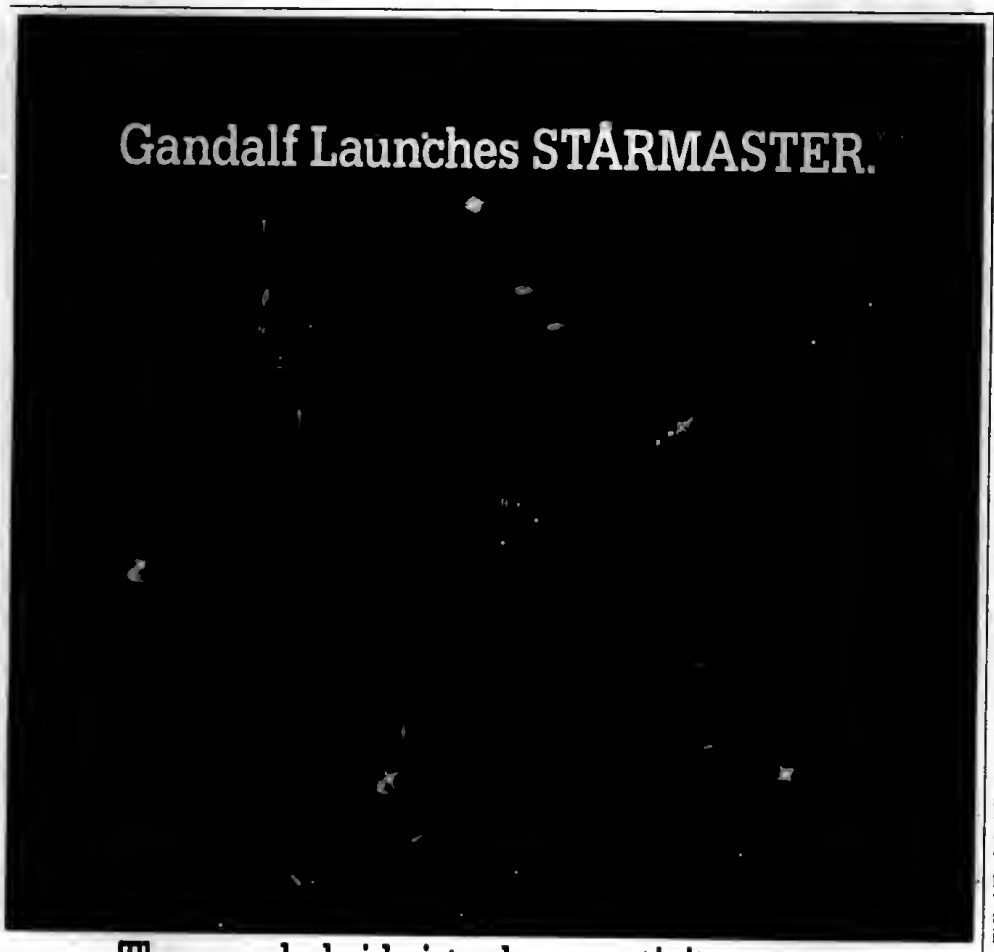
**WHILE a cool head is often needed in decision-making, intense computer users tend to rely solely on logic and disregard the equally important creative process.**

### Staff conflicts

From my consulting experience, I have found the major area of conflicting styles in a company to be between product development and the marketing or sales staffs.

For example, a marketing team asked for information from a nontechnical end-user perspective concerning a certain function of a new software package. The end users received a 40-page report discussing the advantages of one source code over another. The report was factual, intellectual, delivered quickly — and totally useless. This occurred because two cultures collided, and neither fully understood the other's perspective.

My study also found that one result of increased computer use was an increase in use of a detached logic when dealing with other people. When asked about the changes they had undergone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because of computer use, many subjects replied in a strikingly detached manner.

One respondent said, "It has tended to isolate me, but it has allowed me to work in a more logical way." Another stated, "I have developed a way of thinking that is precise and exact, very literal. I take everything literally."

While a cool head is often needed in decision-making situations, intense computer users tend to rely solely on logic and disregard or deny the equally important creative process. Studies such as the ones being done by Mary Henle at the New School For Social Research in New York and J. P. Guilford at the University of Southern California show that creativity — earmarked by intuition and emotion — is not usually a logical enterprise.

Thus, overly involved computer users often cannot make the leap from a set of data or experiences to a unique creative product. What flows from logic alone is merely a refinement of a previous product. The overuse of logic precludes risk taking, which is basic to creating radically new products.

So we come to a dilemma. As creative people spend more and more time working at computers, they become increasingly logical, losing the creative edge that made them valuable in the first place.

### Isolation

A high achiever in his professional life, the intense computer user places unrealistic expectations on both himself and his partner in the pursuit of an ideal relationship. As with the machine, these people seek an intense personal relationship with little or no emotional content, pursuing deep human relations without the patience normally associated with social encounters.

This is often met with frustration and failure, since human relations take time and patience. Because of his lack of success, an intense user gradually narrows his social sphere to include only other computer users. He uses the computer as the basis of the relationship and as the primary topic of conversation.

As he meets with increased failure in the social sphere, the heavy computer user becomes increasingly isolated from other people, turning more and more to his machine for satisfaction and self-esteem.

"A friend of mine," one interviewee reports, "is practically a hermit. He has an obsession with this [computer] stuff and tends to act like a 4-year-old when it comes to people. He is socially insensitive." The interviewee also says that when this friend becomes angry, "he just completely crawls into a hole." He follows the same course if a woman breaks off a relationship with him. "It's sort of a revenge cycle," he says.

Another respondent tells of an acquaintance who seemed to do nothing but hack on his computer all last year. "This guy did not know how to communicate with people. What was worse was that he had no idea what he was missing."

Yet another respondent states, "I know people here who seem to think that the computer is their friend — and maybe their only friend." He describes these people as having difficulty relating to people. "They find it easier to talk to a machine."

### Mind-altering effects

Computers are changing our society functionally and psychologically. We must address the dangerous side effects that come part and parcel with the computer age: the insidious altering of our psyches and our ways of dealing with other people.

Those who use computers must make a concerted effort to maintain social contacts, not only within but also outside of the computer field, in order to strike a balance in their lives.

As one computer professional put it, "If you're in a position where you're spending a good amount of an eight-hour day at a terminal, then you're withdrawn. You are not interacting with people, and I think that's dangerous."

If we ignore the dangers of computers and make no effort to mitigate them, we relegate the human to the level of the machine and, in the process, lose that which makes us uniquely human. ●

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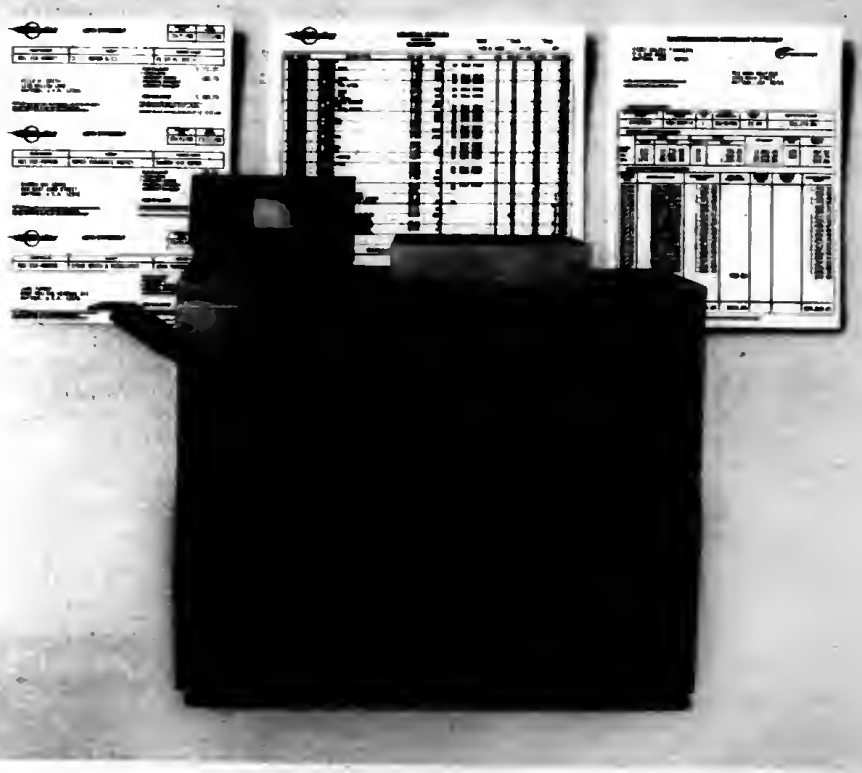

# 'The passing of remoteness'

BY PHILIP BOSSERT

I remember poem about a man sitting on a hill overlooking his hometown on a Sunday morning while he listened to the church bells ringing. He remembers the time when there was but one church in this small town, and its bell rang out with a singular meaning and gave direction to the place where one could worship one's deity.

Now he laments the confusion of so many churches ringing their bells at once, calling people in every which direction to worship a variety of deities. What was once a message has become a cacophony. The confusion of options overwhelms one's freedom of choice.

Many of us grew up in simpler times, in one-bell towns where the choices and directions were perhaps more limited but certainly easier to recognize. Now, most of us find ourselves living in increasingly information-rich and overcommunicated environments resembling a Hong Kong street with its many neon signs simultaneously flashing their messages. Sure, the senses are stimulated, but almost no information is communicated.

This situation is the result of the conflux of two rapidly developing technologies: electronic computers and telecommunications systems. It is clear that computers speed the flow of information in our lives. This increases the amount of data available to us for each decision we make and ups the number of decisions we must make by increasing the number of options available in various areas.

The speeding up of our environments with nanosecond and picosecond processors may make us more productive, but the resulting "decision crunch" (the reduction of time involved in a normal decision cycle) also increases the stress factor.

**MOST OF US find ourselves living in increasingly information-rich and overcommunicated environments resembling a Hong Kong street.**

### Distorted space

The enhanced speed of computers distorts our sense of time. But the instantaneous and simultaneous "presence" of almost anything made available by modern telecommunications systems distorts our sense of spatial relationships. It results in the loss of our sense of place as well as what former Aspen Institute President Harlan Cleveland calls "the passing of remoteness."

The information-overloaded environment results from the fact that technological developments in information systems have focused on increasing the access to, production of and awareness of information. To deal with the increased volume, speed and availability of information, we must develop the technology for assisting our selectivity and judgment.

At another time, as the speed and power of automobile engines increased, the technologies devoted to braking and steering controls had to keep pace. Had this not been the case, the disadvantages of operating an automobile — such as possible death, injury and destruction caused by machines out of control — would eventually overwhelm the benefits. The technology would cease to be useful and used.

The same must eventually be the case for information technology. Ways of making the technology truly beneficial to human beings must be found, or it will simply be rejected as a part of our daily lives. ●

Bossert is manager of strategic information systems at the Hawaiian Telephone Co. in Honolulu.

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The nation's newest weather satellite has completed the U.S. weather-watch system. The Geostationary Operational Environmental Satellite (GOES) H, launched into orbit over the Atlantic seaboard, provides data for meteorologists to predict and monitor storm fronts threatening the East coast. Designed and built by Hughes Aircraft Company for the National Oceanographic and Atmospheric Administration, GOES H carries two experimental payloads: a space-environment monitor (SEM) for solar-wind measurements, and a receiver designed to aid international search and rescue missions.

Using new technologies, an advanced solid-state laser prototype has been produced that is more efficient and more readily scaled from low to high power than currently available models. The Hughes-built prototype uses optical phase conjugation, ensuring that all light waves emitted are in phase, compensating for aberrations and distortions in a laser beam. Also, the new laser material used, co-doped gadolinium scandium gallium garnet, approximately doubles the efficiency and energy storage capacity of the laser. A follow-on contract has been awarded to Hughes for the second and third stages of the U.S. Air Force's Medium Energy Source (MES) program. Future applications of the new laser include communications, range finding, and target designation.

Gate array technology improves the airborne radar performance and increased operational modes for the U.S. Air Force F-15. Pioneered by Hughes, gate arrays are used extensively in the new Hughes APG-70 radar system. They provide the capability to increase the speed of the system's programmable signal processor (PSP) to more than 34 million complex operations per second, five times faster than its predecessor. Gate array technology enables the APG-70 to incorporate operating modes that were unavailable in earlier tactical airborne radars, greatly enhancing the entire F-15/APG-70 weapon system's operational capabilities. The system was developed under contract from McDonnell Douglas, which builds the F-15 for the U.S. Air Force.

Astronomers using a new advanced detector device may discover totally new objects, such as planets around other stars and failed or dying stars. The device, a super-chilled focal plane array, attaches to the bottom of an infrared telescope. It consists of a detector chip and a silicon readout chip that converts energy data into video signals from which television-like images can be produced. The array, developed and built by Hughes, is cooled by liquid helium to -223 to -263 degrees Celsius. This greatly increases the detectors' ability to sense the faint radiant energy of stars being formed and evolving within thick gaseous clouds, known as nebulae.

Hughes Ground Systems Group is applying its airspace management experience to the exciting challenges of worldwide air traffic control. These systems will be designed to ensure service 24 hours a day, 7 days a week. They will support distribution of processing among multiple computers linked via local area networks. The many challenges include design and development of hardware and software to support advanced display and man-machine interface technology, and using satellite technologies for future ATC applications. To help design the next generation of air traffic control systems, send your resume to Hughes Ground Systems Group, Employment Dept. S3, P.O. Box 4275, Fullerton, CA 92634. Equal opportunity employer. U.S. citizenship required.

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# Legislating high-tech

One of the popular themes at recent computer conferences has been the need for adequate computer crime legislation. Although the federal government and most states have a computer crime statute, there is interest in assessing how effective those laws will be when they are used.

Anyone who has been involved in drafting this type of legislation is acutely aware of how difficult it is to construct in order to keep pace with rapidly evolving computer technology.

A noted expert in the field once said the technology that will be on the market five years from now won't be invented until two years from now. It is, therefore, extremely difficult for most of us to plan for more than a couple of years in the future. This problem is exaggerated when trying to anticipate how the criminal mind will exploit technology.

It is difficult to measure the typical length of time required to enact criminal legislation. But it would be unusual for either the state or federal government to pass such legislation within two years of the time the need or problem is first identified.

The development of high-tech criminal sanctions has the potential for being too little too late. When laws and sanctions are passed, the technology will be outdated. Without a thorough understanding of that technology, many legislators will find themselves chasing the high-tech curve and will never catch

*Continued on page 99*

# Consortium brings home DP training

BY DAVID A. LUDLUM
CW STAFF

INDIANAPOLIS — When officials of the Indianapolis Training Consortium, Inc. recently sought bids from data processing training outfits for the courses they wanted to sponsor, they received 230 proposals.

"It took a committee of five people three days to sort through them," says Stan Piercefield, a founder of the 4-year-old consortium and manager of user and administrative services at Public Service Indiana, Inc.

The response illustrates the success the nonprofit consortium has had ever since a group of local corporate DP trainers — despairing over the lack of course offerings in the Indianapolis area — devised it over lunch one day.

The Indianapolis group is one of several local nonprofit consortia that sponsor DP training classes. In addition, dozens of local professional associations of DP trainers sponsor courses with varying degrees of regularity.

The groups are often in medium-sized cities where commercial DP training is less readily available than in major urban areas, although there are organizations in Boston, Minneapolis and Denver.

By contracting with commerical DP training outfits, the groups can bring the courses their members most want to their area, thus saving members travel expenses. Furthermore, they can often negotiate discounts on tuition rates.

*Continued on page 98*

**Setting course**

*DP professionals at 32 companies requested a variety of skills from development courses*

INFORMATION PROVIDED BY INDIANAPOLIS TRAINING CONSORTIUM, INC.
CW CHART: AMY J. SWANSON

# Chase banks on Bond

*Senior VP juggles 100 data centers, $650M budget*

BY GLENN RIFKIN
CW STAFF

Elaine Bond's 21st floor office in lower Manhattan offers a breathtaking view of New York Harbor and the Statue of Liberty. But it is unlikely that Bond spends much time gazing at the sights. As senior vice-president for corporate systems at Chase Manhattan Bank NA, Bond oversees more than 100 data centers worldwide, close to 5,000 systems professionals and an annual budget of $650 million.

Among her responsibilities at Chase — with assets of $99 billion, it is the nation's second-largest bank — are telecommunications, office automation, systems and personal computing. Her own corporate staff numbers 550.

Bond is the first woman to serve as a senior vice-president at Chase. As the equivalent of its chief information officer, she is not only one of the highest-ranking women at the bank but also among the most powerful in the MIS profession.

**Outside the office**

Among the myriad stacks of folders that bury Bond's desk is a 5-in.-high pile of papers relating to her board memberships, advisory roles and chairmanships of countless outside activities that fill to overflowing her already burgeoning life.

Bond is on the board of the prestigious Circle Repertory theater group in New York and the advisory committees of the Carnegie-Mellon School of Urban and Public Affairs and New York Univeristy's graduate school telecommunications program. Just last year, she finished serving on the U.S. Department of Defense's scientific advisory board. In 1982, *Fortune* named her one of the Top Ten Women in Banking.

Yet, at 52, Bond finds time to play tennis, take long walks on Long Island beaches and attend concerts and the theater with her husband. She spent her summer vacation single-handedly putting an addition on her home. A frustrated engineer — an eighth-grade teacher advised her against engineering as a profession for a woman — Bond likes to paint and make furniture as well as build.

"My main issue," she contends, "is that there are not enough hours in the day."

Bond, who graduated from Tufts University with a degree in mathematics, spends little energy dwelling on her pioneering on behalf of her gender. There simply is not enough time. In

*Continued on page 102*

**PROFILE**

**Elaine Bond**

YVONNE HEMSEY/GAMMA LIAISON

**Position:** *Senior vice-president for corporate systems, Chase Manhattan Bank.*

**Mission:** *Steering connectivity, fee-based services and information systems strategy at the nation's second-largest bank.*


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# Consortium

CONTINUED FROM PAGE 95

Stepping into a commerical DP training void, the Indianapolis group has become one of the strongest. Most major employers in the area now belong, and the consortium's strength reinforces itself as it wins discount tuitions.

"Pretty much the consortium has locked up central Indiana. If any training vendor wants to do business in central Indiana, they darn well better go through the consortium," Piercefield says. "We really do a lot of dickering with them to knock the price way down."

Market clout can also help in setting standards for quality. "We've had a couple of vendors whose classes really didn't go well. We leveraged a little pressure, and those vendors refunded the fee," Piercefield says.

The 11 companies that founded the Indiana group each pledged $500 in seed money. Officials at one member, a bank, took responsibility for administrative chores for the first year.

Consortium leaders surveyed members on training needs and issued requests for proposals to about 50 training vendors. "Some of the vendors had no idea there was that much demand in the central Indiana area," Piercefield says.

The first year, the group put on 12 classes. Then, as now, they were held at member companies. Employees of nonmember companies are welcome to take courses, at a higher fee.

At the end of 1984, the group contracted with a management firm to handle administration. It now has 28 corporate members from a variety of industries; most of them are large IBM shops. This year, the consortium is sponsoring 24 classes worth more than $100,000.

Paula Kirby, a Banc One Corp. trainer who helped start the group, transferred to Columbus, Ohio, in 1984 and again found a lack of commerical DP training. "I've just found, by and large, that no vendors came to the Midwest," she says. "I proposed that I be allocated the time to get [a consortium] started here."

The Mid-Ohio Training Consortium, Inc. is also a nonprofit corporation. It still handles its administration through the volunteer efforts of members. Corporate members, now numbering 39, pay a one-time $500 fee to join, with a six-month money-back trial period. Nonmembers pay a tuition premium of about 20%.

In Richmond, Va., the 7-year-old Richmond Information Systems Educators group is less structured but plans to sponsor 80 to 90 classes next year.

The group is managed by DP trainers volunteered by the core members. "We just pass it around so it's not too burdensome on anyone," says Peter Yeager, training director for the Life Insurance Co. of Virginia, a subsidiary of Chicago-based Aon Corp.

Officals of the group have calculated that it sponsored about $1.37 million worth of courses at regular prices last year at a cost of about $350,000 — saving participating companies about $1 million. "We're able to negotiate good prices from vendors. I think that's because we're able to create a market they otherwise wouldn't have," Yeager says.

# Softening up DP pros

BY DAVID A. LUDLUM
CW STAFF

In their recent survey of members' training needs, officials of the Indianapolis Training Consortium, Inc. discovered what one calls a dramatic shift toward classes in "softer" management and personal skills rather than technical ones.

"We see that as a real emerging trend," says Stan Piercefield, manager of user and administrative services at Public Service Indiana, Inc.

"The colleges and universities are doing such a great job in preparing professionals, we don't have to teach them Cobol and JCL. They're into fourth-generation languages already at the college level," Piercefield says. "But they don't get the softer skills. They don't really learn how to communicate. What college offers a course in creative thinking?"

Leading the list of requested classes was communications skills for DP professionals, cited by 104 prospective students. The most sought-after technical class, structured systems analysis, ranked seventh on the list with 76 requests (see chart page 95).

DAVID LUDLUM


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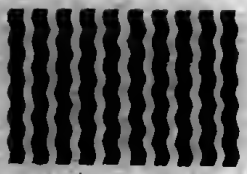
The wishful promises of vendors who are trying to jump on the CASE bandwagon. They demonstrate part of the CASE solution, and hope you'll wait until they develop the rest of their system which they promise will be ready "any day now." Meanwhile, even if they could help you develop a brilliant applications strategy, you have no clear way to implement it.



Piece Parts

Some CASE suppliers offer a small piece or two of the puzzle. A front-end here. A back-end there. Integration? No problem! Just as soon as they can make Company A's front-end work with Company B's repository, and tie everything into Company C's code generators.

Projections

One way to evaluate a CASE system is to simply visit the installations where the product is up and running. Most CASE vendors will tell you where their product might be installed in the future...if you don't mind waiting.

# Legislating

CONTINUED FROM PAGE 95

up. This will create a critical gap between the law and technology that will be fertile ground for high-tech thieves and criminals.

This problem can be avoided if the problem is approached from the proper perspective — the changing nature of property. The past decade has often been described as one of a computer revolution, and a void in criminal law has typically been attributed to the computer.

In fact, the real revolution has been an information revolution. The problem with criminal law predating 1980 was that information suddenly became property with real and significant value with very little warning and without much preparation.

The old concepts of tangible property that dominated criminal law were derived from the days of the horse and buggy. Livestock was valuable property, and the dollar was based on the gold standard. Property could be easily defined and identified.

With the sophistication of modern businesses and vehicles of finance, possession of tangible property often has little significance in terms of who actually has title to the property. Rather, the electronic binary digits stored in a bank or mortgage company determine who owns the property and its market value. This property — the information of title — has real value. This is especially evident in shared property such as large limited partnerships and common-stock companies, where direct ownership is difficult to apportion. The numeral "1" in place of where a "0" should be or vice versa could make a difference of $1 million in readily convertible liquid assets.

Liability can be affected as well. Debt obligations and the responsibility for damages can be altered through data manipulation.

Information in modern society is extremely important. How that information is transported, stored and manipulated is also important. Simple access to information can be critical. Additionally, untimely disclosures of various financial transactions can have a tremendous impact on the marketplace.

Another aspect of the information revolution is a change in the type of information that has become valuable. Client sales and mailing lists and demographic data on individuals' incomes, hobbies and employment all have applications in marketing and thus have value.

Before the past several decades, we didn't think in terms of this information having significant value. For it to be useful required labor-intensive manual systems.

Now, the information that was processed in days is handled in seconds. The output that had to be handwritten or typed is now automatically generated on printers. The speed and volume at which information can be processed has changed that information into something of value.

**Staying ahead of the game**

Therefore, those who design statutes around the tool rather than the property will probably always be trying to enact laws to cover aging technology.

The real effort in modernizing our criminal codes will be the challenge to redefine property and its nature. Whether we want to accept it or not, information is property in the same way as the computer that processes it. Civil and criminal law must quickly be revised to support this new concept of property if society wants to deter future disasters of overwhelming proportions.

We need to define intangible property such as knowledge and data, both in a stored format and in the intellectual format.

We need to determine when proprietary interests can be assigned to that property. How can that interest be recorded? We need to define how value is established, what has value and whether the value of information is static or dependent on its location or on what is being done with it.

These issues and questions may seem unlimited and overwhelming, but they must be addressed, and soon.

We are living in the information age. Computers are only the wagon we rode to get here.

Zwank is chief of the Information Systems Division at the Federal Law Enforcement Training Center in Glynco, Ga.

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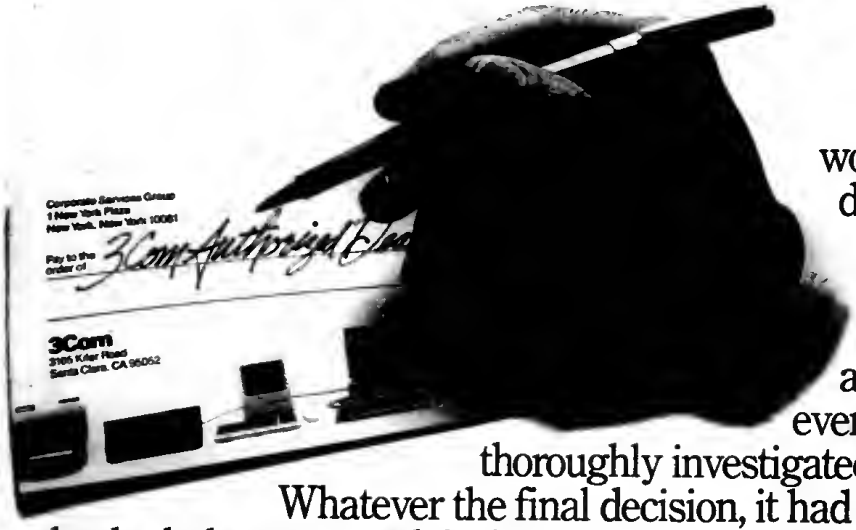


When one of the world's biggest banks decided to network its Corporate Services Group, the long term implications of such a decision meant that every option had to be thoroughly investigated.

Whatever the final decision, it had to be an investment that both the group and the bank could live with for a long, long time.

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# Chase's Bond

FROM PAGE 95

1981, after 23 years at IBM — most recently as group director of information systems at the White Plains, N.Y., data processing complex — she came to Chase with a mandate to put order into a chaotic systems strategy.

### Sobering experience

Coming from the technologically pristine world of IBM to Chase was more than a sobering experience. "I went through a version of 'Oh my God, what did I get myself into?' " Bond recalls. "I also was very excited because I saw an opportunity to make a difference." At IBM, Bond says, there is an intuitive understanding of what data processing can do for a company.

"IBM's internal commitment to the use of data processing is more sensitized and pervasive than at Chase," Bond says. "At Chase, everyone will say 'yeah, technology is important,' but there is not the same level of intuition about what technology can do for you."

Bond left IBM, despite a comfortable and happy working relationship, for what she calls "the attraction of change." She gets restless without a challenge. "I'd gotten to a point where I knew IBM well, and the one thing I hadn't done in my life was see the data processing world from a customer's point of view. I thought if I was ever going to make a change, that was the time to do it," she says.

The challenge was bigger than she anticipated. Bond discovered that the financial services industry in general was only beginning to understand the importance of information flow, from traditional lending-type applications to more strategic use of information to boost the bottom line.

### 'Open territory'

To make matters worse, Bond came to Chase just as the decision had been made to decentralize all of the bank's operations. That triggered a wave of enthusiastic yet catastrophic systems euphoria as each newly freed-up business unit moved quickly, without direction, to set up its own shop. The bank had no preferred vendor list or a coherent strategy. "It was truly an open territory, I kid you not," Bond says. "Whatever anybody wanted to do, they were free to do."

In fact, while Bond found little resentment toward her gender, there was open dismay that she had come from IBM. The bank was moving away from big DP centers, minicomputers were appearing everywhere and, among the technical people, it was in vogue to be anti-IBM. "We had one of everything that was ever built by any vendor anywhere," Bond laughs.

Bond, though admittedly biased toward IBM, eschewed the option of nailing down corporate dictates in favor of a more flexible, supportive approach. She emphasizes that patience was the key. She says the tactic worked. "Wisdom has settled in. What we did was pick our places to influence. We didn't lay down edicts that said 'you can't.' We said, 'Here is what we are supporting, this is what we recommend.' "

Through that process, Chase acknowledged it was a multivendor shop and settled on the following three main suppliers: Wang Laboratories, Inc., Digital Equipment Corp. and IBM.

### Still reaching

Nearly seven years later, progress has been made, but Bond says she believes that she is still only a third of the way toward her goal. "What I'm seeing now is the awakening to data movement, to interconnection, to sharing," she explains. The varied, autonomous units, now past the initial frenzy of installation, are starting to seek out ways to interact with other processes in the bank.

"We're beginning to live with the issues of interconnectivity," Bond says. "Everyday, we're growing the interconnect capability, which is making more people become believers. We're still in the growth stage, but I'm comfortable that it's implanted, it's ourtured, and it's growing. In a short time, I'm convinced that a central catalyst won't even be needed. It will grow of its own accord."

Bond's work and abilities have earned praise from her colleagues. "Her greatest strength is understanding the issues surrounding the use of technology and how hard it is to change," says Bob Reffelt, a consultant with EST Prototypes, Inc. in Midland Park, N.J., and a former Chase vice-president. "Her biggest concern is the fact that most organizations underestimate what is involved in going from today to tomorrow."

Bond has earned a reputation as a "roll up the sleeves, get it done" personality, according to Chet Delaney, vice-president and human resource officer for the systems group.

Aside from the responsibility of implementing specific services, Bond also oversees a wide variety of support services. These services are paid for by the individual business units.

She also helps steer corporate strategy in relation to the systems impact on the bank's business.

"Her most consistent theme is to keep individual ideas in a larger context. No matter how neat the technology is, she always wants to know how it fits into Chase as a whole," Delaney says.

Reffelt adds, "She knows how to take the message to the people at the top and to explain the kind of investment needed for the transfer of technology."

### Not an uphill battle

Bond bristles at the suggestion that Chase is fighting an uphill battle against No. 1 Citibank NA, which has been pegged as the leading innovator in the use of technology in banking (see story below).

Delaney credits Bond with making genuine progress in connectivity and applications data bases. But most of all, she has pushed to the limit the idea that services should sell themselves.

To this end, Bond continues to advocate fee-based services which, over time, reduce the amount of budget required from computer services to support those functions.

In addition, Bond designated one of the DP centers as a corporate hub for internal data centers that need to be a gateway to other data centers with dissimilar computer systems. "We are interconnecting all of our DP centers across multivendor lines," Bond says. "And this one center, in order to be in business, must convince all the other DP centers to buy its services."

Rather than looking to maximize profits, Bond's "DO" units, as she calls them, are trying to exist by offering the best price/performance available either inside or outside of Chase.

She insists that the internal selling does not create conflicts. What is difficult, however, is finding technical people who like that mix of business responsibilities. "Good technical people like to work on technical things and don't like to worry about business," Bond laments. Nonetheless, the DP center program has created a "fraternity" of data center managers. The program has become very successful because the managers review each other and set their own standards.

### Challenges still ahead

Bond realizes that she still faces serious challenges before she can reach her goals. Her ever-growing staff, she says, shares the vision, knows what it wants to do and believes in the goals. But Bond is in no rush to push the plans beyond their limits. "If you go out and sell too soon, you create expectations that you may not have the manpower and infrastructure to deliver; you could have sharpshooters working against you."

When the challenge is gone at some future point, Bond may be as well. She would like to take on the challenge of being a chief executive officer in a software or DP business. "That's my strength, that's what I've got really good skills at," she says. "I can be snowed, but it takes a lot to snow me."

For now, the challenge at Chase remains strong. "I expect another two or three years of the intensity with which we're going at it now," Bond says. "I can see little light bulbs going on all over the place. You just know that once you've got their soul, heart and mind, the rest of the body is going to follow."

## Chase vs. Citibank

Chase Manhattan Bank NA's Elaine Bond admits to getting flak from the bank's top executives about Citibank NA's reputed technological edge.

"Do we hear comparisons to Citibank? Yes, sure. But my conviction is that application for application, I'm not aware that they are doing anything more than we are doing. Citibank is a pioneer, and they are very good at getting a lot of ink for the things they do. But I'm not aware of very many things they are doing that most of the other institutions are not doing, perhaps on a different scale, certainly with a lot less publicity," she says.

Citibank's early embrace of automated teller machines won them deserved kudos, Bond acknowledges, but in other areas, such as satellites, it is difficult to distinguish the hype from the hope.

"[Citibank] got a lot of ink for buying their own satellites, but so what? That, to me, was jazz," she states defiantly. "It's not clear that owning satellites as a technology is needed or desirable. Our own analysis was that satellites have a finite life . . . government subsidies to put them up are going to end, they are going to get increasingly more expensive, and that fiber technology is coming so that it will be very competitive immediately. So from our point of view, satellites were not terribly exciting or needed," she says.

Bond credits Citibank leaders such as Walter Wriston and John Reed for their vocal support of technology in the marketplace, a support that embellishes the image. But Chase is content to take a more conservative, grass roots approach toward technology future. "You have to map to the expectations of your corporation and culture. Flash is not us."

GLENN RIFKIN

## CALENDAR

### OCT 25-31

**Artificial Intelligence and Advanced Computer Technology Conference and Exhibition.** Atlantic City, Oct. 28-30 — Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.

**Rothchild Consultants' TOC Conference on Optical Storage for Small Systems.** Millbrae, Calif., Oct. 28-30 — Contact: Rothchild Consultants, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

**Computer Dealers and Lessors Association Joint Meeting with the European Computer Dealers and Lessors.** Bermuda, Oct. 28-31 — Contact: CDLA, Inc., 1212 Potomac St. N.W., Washington, D.C. 20007.

**Computer-based Training and Interactive Video.** Chicago, Oct. 29-30 — Contact: Registrar, Batelle Seminars Program, P.O. Box C-5395, 4000 N.E. 41st St., Seattle, Wash. 98105.

**Mumps Users' Group.** Washington, D.C., Oct. 29-31 — Contact: Mumps Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

**Ninth Annual Computer Law Institute.** Washington, D.C., Oct. 29-31 — Contact: Practicing Law Institute, 810 Seventh Ave., New York, N.Y. 10018

### NOV 1-7

**Eleventh Annual Symposium on Computer Applications in Medical Care.** Washington, D.C., Nov. 1-4 — Contact: Registrar, SCAMC, Office of Continuing Medical Education, The George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

**Third Annual Excelerator User Conference.** Boston, Nov. 1-4 — Contact: Intex Technology Group, One Main St., Cambridge, Mass. 02142.

**International Software AG Users' Conference.** Miami, Nov. 1-5 — Contact: Software AG, 11800 Sunrise Valley Drive, Reston, Va. 22091.

**Conference on Expert Systems Technology in the ADP Environment.** Washington, D.C., Nov. 2-3 — Contact: Lloyd F. Arrowood, Program Chair, Oak Ridge National Laboratory, 4500-North, Mail Stop 207, Oak Ridge, Tenn. 37831.

**The Supergroup (HP 3000) Users Conference — East.** Washington, D.C., Nov. 2-4 — Contact: Supergroup Association, 348 E. South Temple, Salt Lake City, Utah 84111.

**Data Processing Management Association International Computer Conference and Business Exposition.** San Francisco, Nov. 2-4 — Contact: DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

**Electronic Imaging '87.** Boston, Nov. 2-5 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

**Comdex/Fall '87.** Las Vegas, Nov. 2-6 — Contact: Keith F. Westerman, The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194

**Managing Change in Information Resources Management.** Crystal City, Va., Nov. 3 — Contact: Cathy Hirsh, American Management Systems, Inc., 1777 N. Kent St., Arlington, Va. 22209.

**The First International Videotex Forum.** Paris, Nov. 3-4 — Contact: International Videotex Industry Association/AFTEL, 131, avenue de Wagram, 75847 Paris Cedex 17.

**Information Systems Trainers, Fall Conference and Trade Show.** Denver, Nov. 5 — Contact: Ron Barela, 8878 South Allison St., Littleton, Colo. 80123.

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**Leader:** James G. Herman, Independent Consultant, formerly with the Telecommunications Consulting Group at BBN

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Level: Intermediate.

**Leader:** Jerry McDowell, Vice President, Vanguard Telecommunications Inc.

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**Leader:** Gerald P. Ryan, President, Connections Telecommunications Inc.

Today's network manager must understand not only new technologies and standards, but must play many roles in the company. Attend this instructive tutorial for an entertaining and thought-provoking look at what you need to know to be a successful network manager, plus the tools, processes, and organization that will maximize your efficiency.
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**Leader:** Richard deJardins, Director of Technology R&D, Computer Technology Associates Inc.

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Level: Introductory.

**Leader:** Dr. Wushow Chou, Professor of Computer Science and Electrical and Computer Engineering, North Carolina State University

Enroll in this tutorial for detailed instructions on how to design integrated networks. You'll learn about combining voice and data on a single architecture to maximize the efficiencies of wideband services, the migration from classical multipoint to distributed systems, plus cost-efficiency issues and other practical considerations.
Level: Advanced.

**Leader:** Atul Kapoor, Vice President, Kaptronix Inc.

This tutorial gives you a thorough and comprehensive introduction to IBM's NetView and NetViewPC — their operation, technical specs, dependences and functional interactions, plus an analyses of their impact on the industry, significance for users and practical suggestions for implementation.
Level: Intermediate.

**Leader:** Hanes Gaither, President, LINK Resources Corp.

The FCC has ordered AT&T and the RBOCs to adopt CNA to stimulate competition in enhanced data processing services over public switched networks. Enroll in this tutorial to learn the details of the ruling, its implications for service offerings and an overview of who the players will be.
Level: Intermediate.

**Leader:** Len Ellenbein, President, Telcom Systems Group

Attend this tutorial if your company is expanding its network outside the U.S. You'll receive immediately useful information on tariffs, rules, how to handle ordering and service delays, the role of the PTTs, how to deal with the lack of consistency from country to country, and many more issues you must confront to succeed.
Level: Intermediate.

**Leader:** Gabe Kaspersk, President, Kazcom Inc.

This one-day course will help you successfully operate a network control center on a day-to-day level. You will focus on the practical requirements, functions to be performed, systems and tools available and how to put them all together to gain control over your network.
Level: Introductory.

**Leader:** Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding

Take this comprehensive seminar to make sense of the increasingly complex regulatory environment. You will receive a thorough briefing on the legal, social and regulatory issues, the evolution of vendor technology and industry standards and significant developments affecting the coming regulatory year.
Level: Intermediate.

**Leader:** Gary Audin, President, Delphi Inc.

This perennially popular tutorial provides exactly the right mix of concept, technology, and application for the beginner to get a good foundation in data communications. The course notes are excellent reference material and the instructor is one of the most highly regarded professionals in the industry.
Level: Introductory

**Leader:** James Morgan, Principal, J.H. Morgan Consultants

Enroll in this full-day tutorial for a comprehensive foundation in the basics of voice communications — technology, PBX characteristics, switched networks, tariffs, and services, as well as an overview of traffic engineering.
Level: Introductory

**Leader:** Robert L. Ellis, President, The Ares Group

In this intensive tutorial you will learn the structure of the post-divestiture tariffs, the latest January 1988 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics in configuring data networks, the LATA-pure strategy and federal access tariffs and how to use them.
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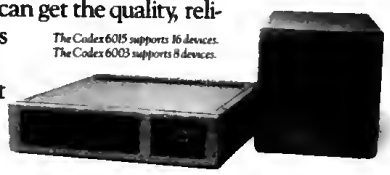

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# COMPUTER INDUSTRY

INDUSTRY INSIGHT

*Clinton Wilder*

## IBM turning too slowly?

A popular metaphor for IBM over the past couple of years has been "the bigger the aircraft carrier, the more difficult it is to turn it around." As IBM continues its slow recovery from the flat reveoue and decreased earnings of its recent past, most of its customers, stockholders and followers seem to be willing to accept that metaphor.

But in an industry where the currents keep changing faster, just how committed are IBM's pilots to changing the company's fundamental direction?

IBM has built a $50 billion business on customers whose modus operandi matched the vendor's initials: I Buy Mainframes. But does the world's most profitable corporation understand that an increasing oumber of information systems executives feel that mainframe computing may not be the best way to serve many of their companies' MIS needs?

At the Alex Brown & Sons Computer Services Seminar in Baltimore earlier this month, IBM Application Software Division Vice-President Bob Berland gave a glimpse of the firm's philosophy. In a question-and-answer session, Berland engaged in a lively exchange with a New York venture capitalist who questioned IBM's commitment to working closely with software partners whose added value would not necessarily help IBM sell more mainframes.

When the questioner cited a large auto parts distributor's forsaking of mainframes for microcomputers for its corporate applications as evidence of a trend, Berland said flatly, "I don't agree with you. It is still more efficient to handle large amounts of data in a central processor instead of stuffing it onto micros." Berland challenged the questioner to "talk to our customers who are buying 3090s like cookie cutters."

On the surface, Berland is not wrong. The case of a user company scrapping its mainframes for local-area networked micros is an extreme one, and

*Continued on page 109*

# NCR, net firms gain in quarter

*Most vendors' results strong; NET notches 446% income boost*

BY ALAN J. RYAN
CW STAFF

Many computer industry vendors continued to make impressive financial gains in segments such as communications in the third quarter, but hardware migration, prompted in part by the IBM Personal System/2 announcements earlier this year, have created problems for others.

Hard disk drive vendor Seagate Technology, Inc. reported an income drop of nearly 40% in the quarter.

Microprocessor vendor Advanced Micro Devices, Inc. (AMD) reported a loss of nearly $54 million, although much of it was attributable to the acquisition of Monolithic Memories, Inc.

Communications products manufacturer Network Equipment Technologies Corp. (NET) caught the wave and rode it to the shore with a 446% increase in its net income over the third quarter last year.

Companies that reported quarterly results last week included the following:

- **NCR Corp.** The Dayton, Ohio-based systems manufacturer recorded a 40% gain in earnings per share for its third quarter, ended Sept. 30.

NCR spokesmen said the per-share gain was the largest for any quarter since 1978, but analysts pointed out that the comparison was against a depressed quarter for per-share earnings last year.

For the period, NCR reported a 14% gain in sales, which were $1.34 billion, compared with $1.2 billion in the like quarter of 1986.

Income for the quarter was $97.8 million, up 33% from NCR's earnings of $73.4 million in the third quarter last year.

Earnings per share climbed to $1.05, compared with 75 cents in the similar quarter last year.

According to analyst Peter Labe of Drexel Burnham Lambert, Inc., NCR's fourth quarter results should be favorable as well.

One reason behind the large percentage increase in earnings, the analyst said, is the fact that "the company had a far worse quarter a year ago than they were expecting."

For 1988, Labe forecasted a 14% revenue gain and a 17% increase in earnings for NCR.

"I think they have the products and the programs to maintain double digit growth," the analyst said.

*Continued on page 110*

### 1987 third-quarter earnings

*AMD and Seagate Technology profits take a dive, while DCA, Silicon Graphics and NET ride high*

| | | | | |
|---|---|---|---|---|
| AMD[1] | ($53.8)[2] | — | $260.9 | +13 |
| ADP | $30.4 | +10 | $361 | +13 |
| DCA | $8.9 | +117 | $50.2 | +27 |
| Intergraph | $18.4 | +10 | $157.1 | +4 |
| Micom Systems | $3.5 | +34 | $52.8 | +9 |
| Monolithic Corp. | $8.4 | +38 | $103.8 | +117 |
| NCR | $97.8 | +33 | $1.38 | +14 |
| NET | $4.2 | +446 | $38.5 | +91 |
| Seagate Technology | $14.8 | −39 | $226 | +20 |
| Silicon Graphics | $2.9 | +70 | $38.9 | +77 |

[1] Reported loss of $43 million in 1986
[2] Parentheses indicate loss

CW CHART


**Inside**

- IBM creates VAN venture with French firms. Page 107.
- Ford acquires U.S. Leasing. Page 107.
- Counterpoint negotiates alliance with Taiwanese firm. Page 108.


# Micropolis at a crossroads

BY JAMES A. MARTIN
CW STAFF

CHATSWORTH, Calif. — In an industry littered with the legends of companies whose supposedly leading-edge technology produced market failures, hard disk drive maker Micropolis Corp. has been a consistent success. But with new technologies such as 3½-in. and optical disks emerging, some observers wonder if the conservatism that has kept Micropolis on top will leave it behind in the future.

"They haven't exactly walked the plank with new product forms," says Jim Porter, president of Disk/Trend, Inc., a Mountain View, Calif.-based storage consulting firm.

Micropolis's product strategy is founded on the principle of "sticking to what you know best," according to Chet Baffa, senior vice-president of marketing and sales. "We've not established a reputation as a leading edge company," he says. "We don't have a broad product line, and we don't want one."

The key to success in the Winchester hard disk drive industry, according to Micropolis officials, is to keep prices down and to sell a small family of products to a large variety of customers.

Micropolis has enjoyed 50% annual revenue growth rates for several years in a row as a result of this simple philosophy. At

Micropolis's Mobon

present, the company offers only three products, all of them 5¼-in. hard disk drives with capacities ranging from 85M to 380M bytes. Pricing is aggressive, as Micropolis manufactures most of its own components and is able to maintain economies of scale in its California and Singapore manufacturing facilities.

But Micropolis has been criticized by some for dragging its

*Continued on page 109*

# McDonnell Douglas slashes 290 info jobs

BY JEAN S. BOZMAN
CW STAFF

ST. LOUIS — McDonnell Douglas Corp. is restructuring its unprofitable Information Systems Group (ISG), laying off hundreds of employees in a reorganization that began in September and continue until next month.

So far, 290 employees have been laid off in various McDonnell Douglas sites around the country, leaving ISG employment at 11,500. By next month, an additional, undetermined number will also be laid off, with the result that overall ISG employment will have been reduced by 3% to 5%.

ISG has lost money in each of the last two years despite annual revenue of more than $1 billion.

Word of the layoffs trickled out of the McDonnell Douglas facility here last week, even though the company had tried to keep the reorganization low-key. The move had been announced to McDonnell Douglas employees Sept. 24 through a 25-minute videotaped speech by Jeremy J. Causley, group executive officer of the Information Systems Group.

"After a one-year period of investigating the ISG organization, it has become apparent that some of our operations are investing too much in the context of earnings we expect," Causley told employees. "Our goal is to conduct our business more efficiently."

Executives within each of ISG's eight business units have the power to implement the restructuring in their own way.

ISG, formed in 1984, had a pretax loss of $69.7 million last year on revenue of $1.19 billion, and a loss of $109.3 million in 1985 on revenue of $1.11 billion. In the past, McDonnell Douglas management has ascribed much of ISG's losses to the cost of amortizing ISG acquisitions, such as Tymshare, Inc. and Microdata Corp..

The ISG's divisions focus mainly on software and services, with the exception of the Computer Systems unit, which sells Pick Systems' Pick-based systems formerly made by Microdata.

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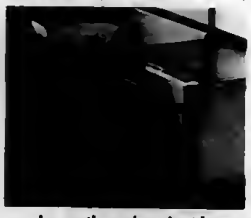

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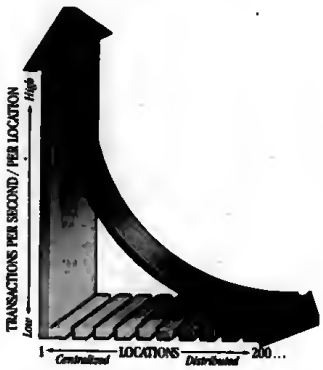


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# IBM creates French VAN venture

BY AMIEL KORNEL
IDG NEWS SERVICE

PARIS — IBM recently became the first company to benefit from the recent moves by the French to deregulate the country's telecommunications services market with the creation of s joint value-added network (VAN) services venture with French software and services group Sema-Metra and two major financial institutions.

The move was expected. In June, IBM announced plans to go ahead with the venture after completing s feasibility study that it had started in February 1986.

The new firm, which is called Axone and is 45% owned by IBM, is being created following the publication last month of s series of decrees permitting private operators to resell value-added traffic generated over private lines leased from the state-run postal and telecommunications monopoly.

**Three-year effort**

IBM has been nipping st the heels of Europe's slow-going deregulatory efforts for the past three years.

Recently, IBM has argued that liberalized telecommunications equipment and services markets would stimulate European information technology businesses as well as increase competition within the European industry.

IBM has already announced VAN services ventures in Italy, Spain and Denmark.

**Diversified services**

As recently as Sept. 3, the company revealed that it had entered into s joint study agreement with Sweden's L. M. Ericsson, one of Europe's leading telecommunications vendors, that will focus on intelligent networking over leased lines.

According to an IBM spokeswoman in France, Axone will eventually offer services aimed st the insurance and automobile industries.

But initially, the new firm reportedly will sell backup teleprocessing services previously offered by IBM in France through the company's International Network Services unit.

One issue raised by the IBM venture is France's Postal Telephone and Telegraph authority's (PTT) demand that within two years, all service providers must conform to the Open Systems Interconnect (OSI) standards framework. IBM and PTT officials reportedly privately scoffed at the notion that this is s surprise or s problem for IBM.

**The OSI gospel**

The PTT, as well as most European communications vendors, have preached the OSI gospel for some time.

In addition, although IBM's predilection for its proprietary Systems Network Architecture (SNA) protocol is no secret, the company has repeatedly expressed its support for OSI and developed products to back up those claims of support.

The Axone network, which is immediately operational, is based on SNA, with the intention of offering access to OSI protocols "as they are available," according to the IBM spokeswoman.

The new firm reportedly will be 30% owned by the investment and banking group Paribas and its affiliate Credit du Nord. It will be 20% owned by nationalized banking group Credit Agricole and 5% owned by Sema-Metra.

# Ford agrees to acquisition of U.S. Leasing for $512M

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — After long discussions all this summer concerning a buy-out, Ford Motor Co. has agreed to acquire U.S. Leasing International, Inc. for more than $500 million.

According to s U.S. Leasing spokesman, the acquisition is slated for completion by the middle of next month.

U.S. Leasing, based here, writes leases for a wide variety of equipment, including small business computers, electronic test devices and railroad and aircraft gear.

**Two computer divisions**

Two of U.S. Leasing's seven subsidiaries, which are also located here, handle the computer business.

U.S. Leasing Corp. handles the leasing of microcomputers, and U.S. Portfolio Leasing offers rental arrangements on similar equipment.

When the deal goes through, Ford will inherit approximately 1,700 employees, most of whom are based in the San Francisco area. Ford will obtain U.S. Leasing's assets, estimated at $1.65 billion.

U.S. Leasing directors have already approved the acquisition, which is based on Ford's $68-a-share tender offer and is estimated at $512.5 million.

"We've been s profitable public company for many years," U.S. Leasing spokesman Ernie Haycox said.

"But now, the Ford parent will give us an opportunity to develop new services and products," Haycox added.

**Products not named**

Haycox would not specify the type of products that are expected to come from the new company.

However, he did stress that employees are generally pleased with the buy-out.

Under the terms of the new arrangement, the current U.S. Leasing management structure will stay intact, as will the company name.

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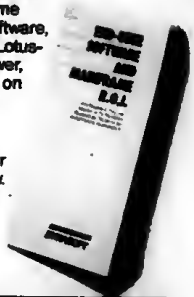

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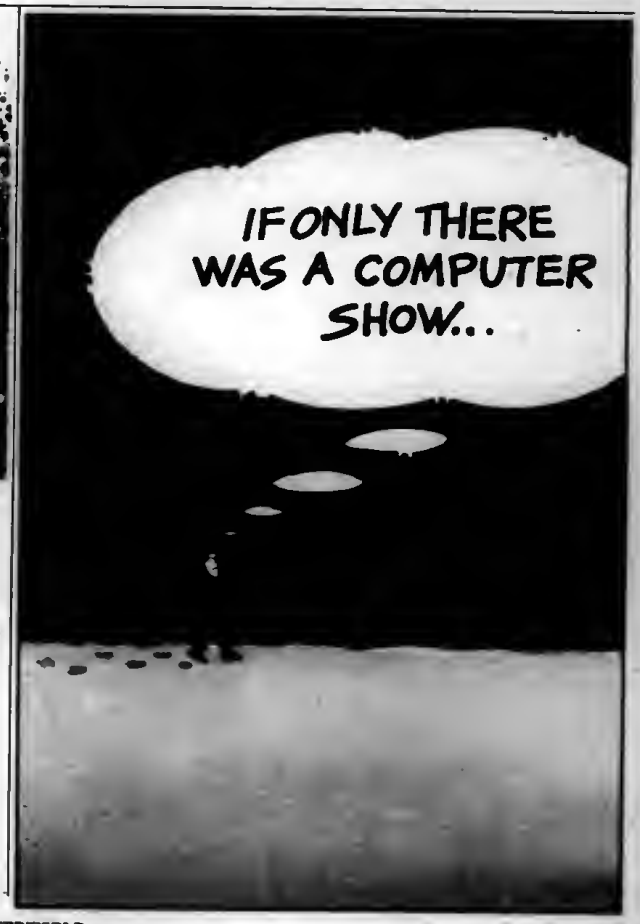

## EXECUTIVE CORNER

**C. B. "Jack" Rogers Jr.**, formerly a senior vice-president with IBM, has been elected president and chief operating officer of **Equifax, Inc.** Rogers has been a member of Equifax's board of directors since 1978.

Rogers helped organize IBM's General Systems Division in 1969 and was president of the division until 1979. He became a senior vice-president in 1982 and was a member of IBM's Management Committee and Corporate Management Board.

**Arete Systems Corp.** recently announced the appointment of **Gene Manno** to the newly created position of chairman and chief executive officer.

Manno comes to Arete from Honeywell Bull, Inc., where he served as executive vice-president and was responsible for the Departmental Systems and Office Marketing Systems divisions with special emphasis on major customer projects and new business development.

Prior to the formation of Honeywell Bull, Manno headed Honeywell Information Systems' small computer and office systems operations as group vice-president.

**National Semiconductor Corp.** announced the appointment of **Richard C. Eppel** to the position of vice-president for product operations in National Semiconductor's Information Systems Group.

Eppel has overall responsibility for coordinating development and manufacturing efforts of product operations groups within National Advanced Systems Corp. and Datachecker Systems, Inc. Prior to joining National Semiconductor, Eppel was president of Parallel Computers, Inc. in Santa Cruz, Calif.

**NCR Corp.** announced the appointments of **Richard B. Reese**, as vice-president of its corporate Customer Services Division, and **Gary W. Burnett**, as vice-president of its U.S. Data Processing Group Customer Services Division.

**Tandem Computers, Inc.** announced that it has appointed **Robert G. Gargus** as corporate controller and **Gerd Stoecker** as treasurer. Both will report to Tandem Vice-President and Chief Financial Officer David J. Rynne.

**Wayne N. Harvey**, formerly vice-president of development at Oracle Corp., has joined **Orion Network Systems, Inc.** as vice-president of software development.

Harvey will be responsible for expanding Orion's connectivity software products that implement both IBM Systems Network Architecture and ISO standards.

**Neti Technologies, Inc.** announced the appointment of **Gary R. Balleisen**, the creator of Supercalc, as technical advisor.

Balleisen was involved with the design and development of Ashton-Tate's Dbase III and Dbase III Plus. In 1981, he wrote the original version of Supercalc. Most recently, Balleisen produced Migent Software, Inc.'s Ability Plus, an integrated software product that competes with Lotus Development Corp.'s Symphony and Ashton-Tate's Framework.

Balleisen is president of his own firm, Profound Software, Inc. in Pacific Grove, Calif., which provides microcomputer software development and documentation services to software publishing firms.

**Multiflow Computer, Inc.** announced that **Jan R. Brundin** has been appointed to the new position of vice-president of product management. Brundin joins Multiflow Computer from Unisys Corp., where he was vice-president of product strategy and development.

# Counterpoint to buy Taiwanese firm

BY JULIE PITTA
CW STAFF

SAN JOSE, Calif. — Counterpoint Computers, Inc. officials said last week that Counterpoint is negotiating a strategic alliance with Taiwanese company MSC Group but declined to offer further details amid reports that Counterpoint will be acquired by MSC.

MSC is one of Counterpoint's largest OEM customers. Sources said that an alliance between the two companies should be formally announced within the next few weeks.

A manufacturer of Unix-based multiuser systems, Counterpoint has supplied MSC with its System 19K computer since late last year under a three-year, $20 million OEM agreement between the two companies.

The Counterpoint computer has been the cornerstone of a multiuser system sold by MSC members Multitech Industrial Corp. and Sertek International, Inc. in the Far East and Europe.

Other terms of the OEM agreement call for Counterpoint and MSC to jointly develop and market future products.

A Taiwanese conglomerate, MSC boasted sales of about $200 million last year.

Privately held Counterpoint, founded in 1984 by former Convergent Technologies, Inc. executive Pauline Alker and a Convergent colleague, has sought alliances with a number of other computer companies in order to obtain financing. Among its most prominent investors are AT&T and Kyocera Corp.

Counterpoint President and Chief Executive Officer Alker was in Taiwan last week and could not be reached for comment on the future relationship with MSC.

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# Micropolis

FROM PAGE 105

feet on the 3½-in. hard-disk technology. While most disk drive companies are beginning to establish a foothold in that growing market, Micropolis has remained silent.

Micropolis will announce next year a 3½-in. hard disk product, according to President Stuart P. Mabon. But he would not elaborate. In addition, the optical disk drive market is expected to gain favor among data processing managers and MIS directors for archiving and desktop publishing applications, among others. While other disk makers, such as Seagate Technology, Inc., have at least announced intentions, again Micropolis has been quiet.

"There are a lot of risks in optical," Baffa says. "There are no real standards established, and there really isn't a strong market there yet. We would rather run the risk of not being in a market than in being in a market with the wrong product." Baffa does not rule out optical disks as possible product offerings in the long term, however.

By all accounts, Micropolis is poised at the top of its industry. Estimates give the firm a 50% share of the 5¼-in. hard disk market, a market that is expected to grow 50% a year for the rest of the decade.

### 'The hottest'

"Micropolis is the hottest company in the industry right now," says David P. Vellante, storage analyst for International Data Corp. in Framingham, Mass. "They are the industry leader in high-capacity 5¼-in. products, their stock is doing well, and they are making money."

What impresses analysts and observers most about Micropolis is the company's wide array of OEM customers for its hard disk drives. While some hard disk makers have become overly reliant on — and therefore vulnerable to — large contracts with computer makers, Micropolis's customer base is a veritable Who'a Who of computing. It includes AT&T, Digital Equipment Corp., Apollo Computer, Inc., Sun Microsystems, Inc., Unisys Corp., Hewlett-Packard Co., Wang Laboratories, Inc. and Prime Computer, Inc.

Known mainly as a hard disk vendor for workstations, Micropolis is beginning to edge into the high-end microcomputer arena as well. Most notably, Micropolis is supplying Compaq Computer Corp.'s new 386/20 Model 300 system with a 380M-byte hard disk drive.

The 380M-byte hard disk is seen as pivotal to Micropolis's future. Along with Compaq, Micropolis is also supplying AT&T with the high-capacity hard disk for that company's 3B2 minicomputers. Previously, Control Data Corp. had been supplying most of AT&T's hard disk needs.

Although its product line is conservative, Micropolis is not exactly sitting still. At Comdex/Fall '87 next month, the company reportedly will introduce a 760M-byte 5¼-in. drive as well as its first half-height hard disk, with 182M bytes. Half-height disks are becoming increasingly popular for microcomputers because of the small form factor.

Another potential competitive threat may come as Micropolis customers such as DEC and HP expand their own disk drive manufacturing capabilities, sparking concerns that there will be less need to buy drives from Micropolis.

"Most big computer companies at one time or another make their own disk drives, but they can't afford to make them all," Mabon says. "Our job is to supply them with drives they don't make and act as a standby for the ones they are planning to make but don't work out."

# IBM

FROM PAGE 105

IBM *is* selling a lot of 3090s.

But what about the future? Does IBM have any plans to wean itself from relying on that part of the computer business which, with 80% gross margins humming along, has rewarded the company with industry dominance?

### No shift in focus

Sure, there is the 9370, the Personal System/2, Silverlake, Systems Application Architecture (SAA), Solutionpacs and the much-heralded Micro Channel. But has the industry seen any real evidence that IBM's basic philosophy has shifted away from getting more (and larger) mainframes out the door?

Mainframes, of course, are not going to go away. There are now and will be thousands of MIS shops that will continue to buy or lease IBM mainframes in healthy quantities.

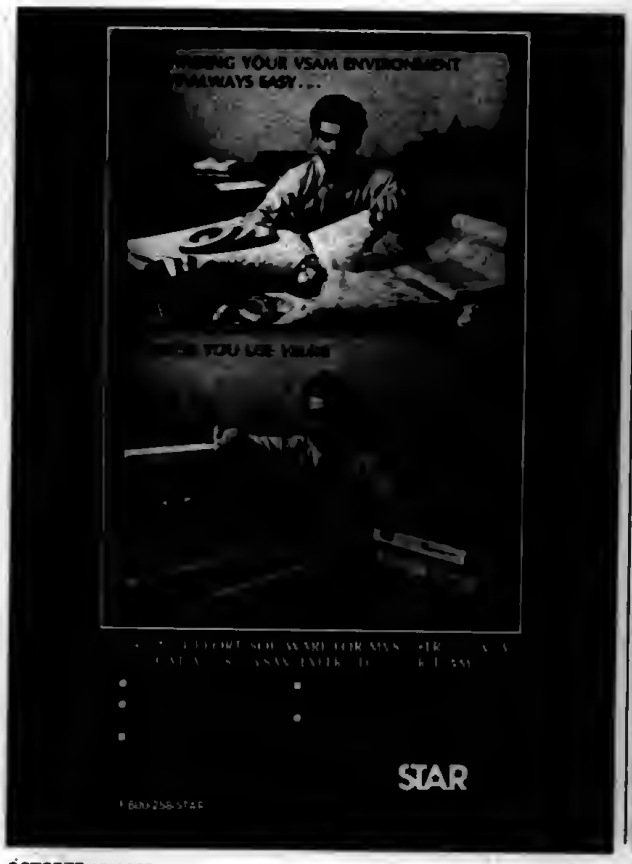
And there is plenty of innovation going on in those same shops in finding new and better ways to link and use the high-MIPS workhorses.

But the revolutionary (or evolutionary, as so many marketers are fond of saying) changes in technology and the corporate philosophy of MIS have brought a whole new set of rules to the industry game. "The Digital style of computing" may be a pompous, gimmicky phrase by which DEC sells its VAXs, but it does speak to the point of seeking alternatives to the mainframe.

DEC's market-share gain is a solid example, but so are the corporate success stories of Sun Microsystems, Tandem, Compaq, Oracle, 3Com, Novell, Apple and scores of others. A brief scanning of trade publication headlines says a lot; just last week, *Computerworld* reported that McDonnell Douglas will replace an IBM 3032 with a Tandem VLX to support its EDI-Net network.

With the 9370 and SAA, among other announcements, IBM would seem to be turning its ship in the right direction. But strategic new products and software directions are not enough. IBM must be ready to acknowledge that its users are moving away from mainframe myopia, and if it is truly committed to "The Year of the Customer," it had better do the same.

Wilder is *Computerworld's* senior editor, computer industry.

# Firms gain

FROM PAGE 105

Because much of NCR's revenue gain is overseas, Labe said some of the revenue growth stems from a positive currency exchange to U.S. dollars.

• **AMD.** AMD recorded a loss of $53.7 million, or 72 cents per share, on sales of $260.9 million for the most recent quarter, ended Sept. 27.

The Sunnyvale, Calif.-based chip vendor said the results for the quarter include a one-time charge of $41 million associated with the acquisition of Monolithic Memories.

The merger of AMD and Monolithic Memories was completed Aug. 13.

In last year's like quarter, the two companies had combined sales of $229.1 million, with a loss of $43 million, or 56 cents per share.

That period included an unusual charge of $19.9 million, AMD spokesmen said.

• **Seagate Technology.** The Scotts Valley, Calif., vendor of rigid disk drives announced a 39% decrease in earnings for its first quarter, reporting $14.8 million, or 30 cents per share, compared with income of $24.5 million, or 50 cents per share, for the like quarter last year.

Sales for the period were $226.1 million, an increase of 20% over the $189 million reported for the comparable quarter a year ago. The sales represent a decrease of 10% from the $250 million reported for the preceding quarter ended June 30.

The earnings for the recent period reflect a 60% decrease from the $37.2 million, or 74 cents per share, reported for the quarter ended June 30.

"Basically, the competition has heated up in the disk drive area as there was a production transition into higher capacity products and down to 3½-in. drives," explained analyst Gary Shields of L. F. Rothschild & Co.

Shields said Seagate's shipments were down just 1% in the third quarter, although the selling price per unit was down 8%.

For the current quarter, Shields forecasted $245 million in sales and 38 cents per share in earnings.

Seagate "will not reach volume production of 3½-in. drives in the December quarter.

When they do reach volume production, either in the March or June 1988 quarter, the company's earnings will begin to be positively impacted," Shields noted.

However, he added, pricing pressures will continue to be severe.

• **NET.** A 91% increase in sales and a 446% increase in income was recorded for the period ended Sept. 27 by the Redwood City, Calif., developer of advanced communications products.

Sales for the period were $20.5 million, compared with $10.7 million in the like quarter last year.

Income was $4.2 million, or 31 cents per share, compared with $780,000, or 6 cents per share, in the comparable period last year.

The income reflects an extraordinary tax credit, which was a result of net operating loss carryforwards of $1.5 million, or 11 cents per share, for the quarter.

• **Automatic Data Processing, Inc.** Profits for the Roseland, N.J., computing services firm rose 34% to $30.4 million, or 39 cents per share, compared with $22.7 million, or 30 cents per share, in the similar quarter last year.

A lower effective tax rate had a positive effect on the earnings, according to the company.

Revenue for the period was $361.3 million, up 13% from sales of $321.1 million in last year's like quarter.

• **Digital Communications Associates, Inc.** (DCA). For its first quarter ended Sept. 30, DCA reported earnings of $8.9 million, or 59 cents per share, up from $4.1 million, or 28 cents per share, for the same quarter a year ago.

Sales totaled $50.2 million, an increase of 27% over the previous year, when sales were $39.6 million for the quarter.

The Alpharetta, Ga.-based company attributed the increases in part to a reduction in earnings of nearly $4 million in the first quarter last year.

Also credited for the increase were new personal computer communications products and the continued success of networking equipment operations.

• **Silicon Graphics Computer Systems.** The company reported a large increase in sales for the quarter as its reduced instruction set computing architecture proved to be successful, according to Edward R. McCracken, Silicon Graphics' president and chief executive officer.

For the first quarter ended Sept. 30, sales were $28.9 million, an increase of 77% over the like period for the prior fiscal year, when sales of $16.3 million were recorded.

Earnings climbed by 70% to $2.95 million, or 22 cents per share, compared with the $1.7 million, or 16 cents per share, reported in the similar quarter last year.

• **Intergraph Corp.** Huntsville, Ala.-based Intergraph recorded a 19% increase in income for its third quarter. Profits for the period were $18.4 million, or 32 cents per share, compared with $15.5 million, or 28 cents per share, for the like quarter last year.

Sales rose to $157.1 million from $150.9 million in the similar period in 1986.

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**Here's what happened.**

The new CFO of a $2 billion-plus consumer products company had a reputation for toughness that the MIS director soon learned was well deserved.

Within weeks after taking command, the CFO made his demands known. He wanted five years of data available for each division and each product line–up from three years. He wanted faster reports and faster analysis from his staff. And he wanted MIS to arrange for all of this "as soon as possible."

There was only one problem. And the MIS executive knew it. What the CFO wanted was simply impossible to do well without a fourth generation language solution. And the MIS executive had enough experience to know what a fourth generation language solution would mean.

### TROUBLE, TROUBLE, TROUBLE.

There would be hours and hours of expensive programming and maintenance to support a 4GL solution. And financial analysts still would not be able to work readily with their PC-based spreadsheets.

To complicate matters further, different parts of the existing system kept the same financial data in different formats. The cost of maintaining redundant data that could not be easily shared by analysts was running higher and higher.

A team of MIS executives and financial support personnel soon came to a grim conclusion: Several months would be needed to meet the CFO's demands. And the maintenance problem would grow and grow.

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The solution came from a company called Corporate Class Software.

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The company had developed a product called FASTAR–Financial Application Solution to Analysis and Reporting–that was the first *packaged* solution to *advanced* financial applications.

No fourth generation languages were needed to perform financial applications. No macros were necessary. And all data could be loaded onto Lotus 1-2-3 spreadsheets for work there. (Yes, we'd be skeptical too. You'll find out how all this was done in a minute.)

When the decision was made to test FASTAR, the entire system was set up within a week and loaded with a division's worth of data. Now, when an analyst compared the cost of a product over five years, it took only minutes, instead of an entire day.

What's more, the CFO now had the flexibility to assign new divisions and product lines to his analysts without taking the time to reprogram the system. FASTAR was built to expand horizontally (for companies) and vertically (for products).

How could all this be done?

### THE PRODUCT THAT ALMOST DEFIES DESCRIPTION.

FASTAR acts as a bridge between PCs and mainframe financial production systems, such as the general ledger.

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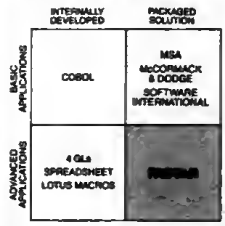


*FASTAR is not a tool, but a ready-made solution for advanced financial applications, including financial consolidation and management reporting.*

With the proper clearances, analysts can access financial information from any financial schedule for any company in the corporate structure. And they can consolidate and analyze that information without ad hoc programming. (Our powerful analysis package is built in, so there's no fourth generation language or macros programming needed. Even analysts who are computer illiterate can derive the same benefits from FASTAR as anyone else.)

As a result, analysts report more quickly, consolidate more accurately, and analyze more frequently.

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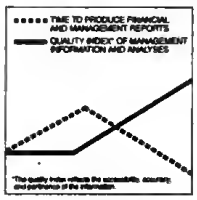


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FASTAR also addresses the critical issue of data integrity and control.

Because FASTAR takes all programming off the spreadsheet, there are no undocumented programs to cause costly mistakes. (One analyst in another company had written a 1,000 line macros program before management pulled the plug. He was the analyst who knew too much.)

FASTAR also eliminates the need for passing data back and forth on pieces of paper and having secretaries or analysts type them into spreadsheets. This reduces the number of potentially dangerous errors that can occur.

And, perhaps most importantly, because all financial information is stored in FASTAR's data base, MIS executives regain control of critical data.

You also protect your company's investment. FASTAR accepts data from fourth generation language products and database management systems, as well as microcomputer applications. (None of the companies using FASTAR needed more than three days to adapt the program to their corporate needs.)

In the final analysis, MIS executives show themselves to be strategic thinkers by giving analysts a tool to be more productive. (Did you know that one company found 85 percent of an analyst's time is spent just looking for data?)

### LET'S TALK

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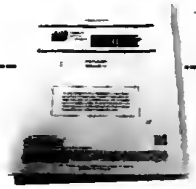

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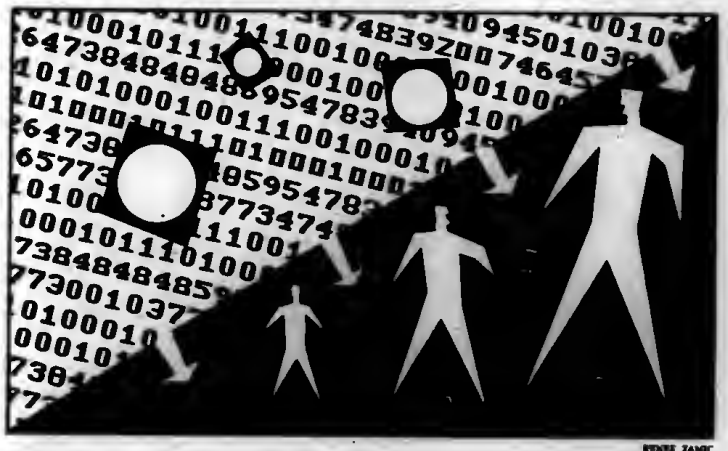
**To control and plan systems in a businesslike way, firms integrate functions and rely on engineered knowledge.**

# CLONING SKILLS FOR PLANNING

BY CAROL WEISZMANN



RENEE ZAMIC

Too often, awareness of capacity management issues comes only with crisis. Certainly, response times and throughput and utilization rates are important, but the person who pores over stacks of printouts covered with incomprehensible numbers may seem more like an auditor than a programmer or an engineer. Capacity management is sometimes seen as a career cul-de-sac, its practitioners as geeks in a technical quagmire. And yet, capacity management is fast becoming mission-critical.

What happens to a bank's business if its computer systems cannot handle the volume of transactions at its automated teller machines? Or to the manufacturer whose inventory control system balks at just-in-time demands?

These days, when MIS's information processing needs are left unanticipated or system planning is poorly done, the damage to the organization's bottom line can be massive. As information systems start to play a critical role in daily operations, the days of MIS as a separate and independent enterprise are diminishing.

The need to ensure smooth systems operations is no longer restricted to the high end of IBM's mainframe preserve. Users are demanding better hardware and software integration from many different vendors. Today's systems are no longer isolated — either from each other or from the enterprises they serve. The price of capacity management mistakes is paid not by MIS but by an organization's operational functions and in corporate terms — lost revenue, lost customers, lost productivity, lost savings.

If today's information systems — be they data center mainframes, mid-range systems serving departmental operations or networks of personal computers — are to operate successfully, they must enlist the help of capacity managers and capacity management software.

Hundreds of software products are already available under the capacity management umbrella. These products perform a broad range of tasks, including controlling data center operations, system administration, data interpretation, problem management, performance analysis and tuning, system sizing and capacity planning.

The Oak Brook, Ill., headquarters of Waste Management, Inc., a waste collection and disposal services firm, like many installations, employs several packages to stabilize and improve service to an on-line user community that has more than doubled at the site since 1986. Among the capacity management products in use at Waste Management's data center, which operates an IBM 3090 under MVS/XA, are direct-access storage device (DASD) management software from Uccel Corp., The Monitor from Landmark Systems Corp. and Stabilize/CICS from On-Line Software International, Inc.

Persistent storage violations under CICS that resulted in increasing numbers of system crashes led Waste Management to use Stabilize/CICS. The company's CICS processing volume, currently totaling about 200,000 transactions per day, is expected to increase to 500,000 per day

Weiszmann is an independent consultant and writer based in Natick, Mass. She specializes in software markets, artificial intelligence, vertical-market strategies and systems integration issues.

# Cloning

FROM PREVIOUS PAGE

by the end of 1988.

"We use Stabilize/CICS on two systems," the firm's senior technical analyst Rudy Pitte says. "On the test system, the transactions being tested will many times go into an uncontrollable loop, but Stabilize/CICS will usually catch the situation and terminate the transaction."

### Two in one

The broad term "capacity management" encompasses two major subcategories — performance management and capacity planning.

Performance management measures the daily level of performance an existing system, data center or network delivers. Performance monitoring software, which measures, records and reports on the key system or network elements, provides the data to determine if service levels are adequate.

The function of performance management is to allocate power — usually stated in terms of million instructions per second (MIPS), I/O rates and so on — to the work load, which usually means setting operating system parameters or DASD management. Performance analysts also monitor systems for response time, utilization levels and work load volumes to establish historical trends and provide data for capacity planners.

Capacity planning determines the requirements for future systems or networks — or upgrades and enhancements of existing systems or networks — based on modeling software that simulates system or network requirements. It requires several kinds of input, including peak-time work load and response- and service-time projections, as well as projections for existing and alternative equipment and configurations. In addition, service-level agreements must be established.

Capacity management is not only diverse but subject to flux as software bends and stretches to accommodate changes in the system. Software is moving in a number of new directions:

- Integration of previously separate functions in single-vendor products.
- Automation of previously manual operational tasks and functions.
- Development of products aimed at new areas, such as mid-range computers, networks and application software development.
- Migration of products to micros.
- Embedding of expert system techniques.

This last development will serve, to some extent, to drive all the others, because the challenge of capacity management is not only to sustain the efficient operation of computer installations but to make sure the capacity management effort itself is efficient.

### Capacity conundrums

The tools that exist today are less than ideal. First, their output is in numbers — lots of numbers — and the population with the expertise to interpret those numbers is dwindling. From the basic input of a capacity plan — configuration and work load data — performance prediction models then compute such factors as response time, throughput and utilizations.

To use these models effectively, an analyst must thoroughly understand, in addition to the particulars of the hardware and the operating system, performance analysis concepts. Although guidelines for such use have been published, they are often too general in specific situations.

In the 1960s, systems programmers dealing with the early models of IBM's 370 architecture spent time debugging the operating systems; as a result, they understood much about the systems' internal workings. Some 20 years later, with virtually oo operating system bugs left, systems programmers have comparatively little understanding of system innards.

"The average systems programmer isn't as smart today about the insides of systems as even five years ago," says Kevin Golden, Reston, Va.-based VM Software, Inc.'s product manager for VM Center II, VM Account and VM Monitor.

The second drawback to the current generation of capacity management tools is that, while the software tends to require technical expertise, businesses now push technicians to display a higher degree of interpretive ability and industry understanding than they possess. Users of such tools must be able to relate the numbers to increasingly complex end-user requirements and business goals.

> TOOLS today are less than ideal. Their output is in numbers, and the population with the expertise to interpret those numbers is dwindling.

"We used to be very successful in plotting where we were going based on historical data," says Alan Sherkow, lead capacity and performance planner at First Wisconsin National Bank in Milwaukee. "But deregulation has brought so many changes that we can't use historical data anymore to figure out the future.

"Now we have to understand the business and its goals," he continues. "We have to communicate with our senior executives in their language, and we have to have credibility in the organization based on past success."

Computer Associates International, Inc.'s Ruth Heidel, development manager for the Garden City, N.Y.-based firm's ISS-3 capacity planning product, agrees. "The computer is an integral part of the business," she explains. "When capacity planners think about their strategies' least cost, or whatever it might be, these are business questions, questions that a technical person might not think of."

Reconciling the increased work load of managing system performance and planning future installations with the diminishing supply of seasoned personnel is a major problem, one that vendors are attempting to address in a oumber of ways.

### One source, one solution

One solution that a number of the leading independent suppliers of capacity management software arrived at is to market a single, comprehensive line of data center management tools.

Their idea is to provide a single-vendor solution for all data center management problems. The scope of data center management is wider than just capacity management and includes software for job accounting and scheduling, network and storage management and security.

Sometimes this integrated software replaces programs written by in-house data center staff, which, according to VM Software's Golden, is a high priority for top management. Managers want to avoid homegrown software, he claims, because it requires maintenance, diverts programming effort from critical applications and often lacks documentation.

Currently, only a few independent software suppliers offer a truly full line of data center management software. Among the few are Computer Associates International, which has now swallowed former rival Uccel, and VM Software.

However, several independents concentrate on capacity management. These include BGS Systems, Inc. in Waltham, Mass.; Sunnyvale, Calif.-based Boole & Babbage, Inc.; Candle Corp. in Los Angeles; and Morino Associates, Inc. in Vienna, Va. Others, meanwhile, focus on highly specialized niches they see as not properly filled by the major suppliers, such as monitoring for a single product type. These firms include Santa Clara, Calif.-based Cambridge Systems Group, Duquesne Systems, Inc. in Pittsburgh and Landmark Systems.

Because the providers of full-line data center management tools have as their goal to boost both revenue and their customer base, the more specialized vendors are being pressured to integrate their product lines.

Software that automates the data center operator console has been available for a number of years. Only recently has interest in it been piqued by faster machine speeds, operational demands of networks and the emergence of an integrated hardware product line, not to mention IBM's Systems Application Architecture, on which the company's Netview offering is based. Much of this interest stems from MIS's need to help its personnel keep up with the operational demands resulting from faster machines and improved systems.

### Speed reading

A data center operator's job involves swift but repetitive routine activities that must be handled with consistency. The typical operator — with less than two years' job experience — must be able to comprehend messages that flash on the data center console at a rate of as many as 10 per second.

As machine speeds continue to increase — from five to six MIPS in the mid-1970s to 50 or 60 MIPS today and to an estimated several hundred MIPS by the early 1990s — the economies of scale the machines promise can be threatened by data center operators whose human abilities simply do not allow the CPU to run at peak efficiency.

The growth in mid-range systems, particularly with IBM's increased focus on medium-size machines, has enhanced

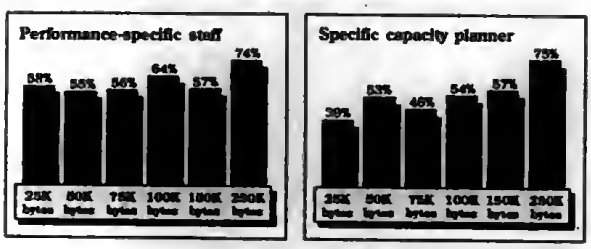
*Continued on page S4*

## System performance at CICS sites

*Allocation of personnel and prioritization of problems among 4,000 CICS installations surveyed by Boole & Babbage, Inc.*

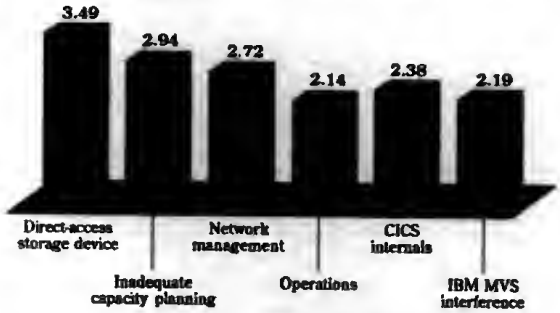
### Utilization of system performance specialists

*Percentage of sites with performance staff and capacity planning specialists by daily transaction load*




### Major performance problems

*Degree of significance to users on a scale of 0 to 5, with 0 indicating no significance and 5 indicating high significance*

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CW CHART

# For system changes, check the tool level

BY THOMAS BELL

The tools necessary for performance analysis may be available for your system — or you may need to develop your own. In the latter case, expect your costs to climb and your results to be late.

Tool development can be an interesting exercise: An expert can really demonstrate his skills by finding ways to extract data or predict bottlenecks. Unfortunately, such efforts can also consume skilled resources, diverting expertise from the task of improving performance.

Being blessed with an abundance of ready-made tools has everything to do with your environment. If you are working in IBM MVS, adequate tools are available for almost any commercial environment. In IBM VM, the list is shorter but still more than adequate.

A number of tools are available for Digital Equipment Corp. VMS, although they typically apply to s more limited set of application environments than the tools available for IBM's MVS.

Some Unix tools are available, but Unix developers do not concentrate on the performance of commercial applications. CPU time distribution can usually be determined, but the causes nf I/O problems and communications delays are not usually revealed by available products.

Beyond these operating system environments, the alternatives are somewhat limited, for reasons of simple economics. Independent firms devote their development capital to the products that promise the largest payoffs. Therefore, users of other systems must frequently depend on those systems' vendors for performance analysis tools.

### Living with limitations

Even in the more sparse environments, some tools are available to support chargeback, set operating system parameters and identify hardware bottlenecks. This is because, historically, performance effort has been oriented toward data center performance management, including capacity planning.

Unfortunately, the data from these tools often does not report the expected system interaction, or it reports data incorrectly. Existing tools can usually be employed effectively, but only if you know how to design associated experiments and perform appropriate analysis after recognizing the tools' limitations and special data definitions.

One of the most commonly used performance measures is CPU time, but in many systems it is not reliably provided by the vendor's operating system. Reports from any tool dependent on CPU time are unreliable to the extent that the underlying data is unreliable.

Much of the problem with inaccurate CPU time arises from allocating the time consumed by the operating system itself to applications. In addition, data base management systems and transaction monitors typically service s number of users simultaneously; their CPU consumption may need to be allocated to those users to support chargeback. Satisfying this objective may compromise other uses of the resource-consumption data.

Other measurements are afflicted by the same kinds of problems as CPU time. As a result of the need for data to satisfy other objectives, computer vendors and other suppliers often develop separate measurement tools.

You may find these tools useful, particularly for improving response times and application system performance. You need to make sure, however, that your definition of a metric is the same as the definition used by the tool's developer.

### Flagging resource hogs

DBMSs, communications software, transaction monitors and major application systems can greatly affect system performance. In most cases, a variety of departments use these products, and some of them may be abusers. The performance of some products clearly abuses the users who have to pay for those resources. Both situations need to be corrected for the technology to be applied effectively.

Systemwide performance measurement tools typically cannot provide the detailed information for addressing the performance of subsystems. Instead, special tools are usually needed to analyze or project their performance.

If you are considering selecting a new hardware or software product, now is the time to look at the adequacy of performance analysis tools. Perhaps the new product's performance can be judged with tools you already own. However, you may need to temper your consideration of its features by evaluating its ability to provide necessary information about its performance. •

Bell is president of Rivendel Consultants, Inc. in Los Angeles.

PERFORMANCE MONITORING

# You Pay For Performance

When can monitoring computer performance be cost justified?

by M. Polan

# Performance

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CONTINUED FROM PAGE S2

the need for automated operations. "IBM's 9370 has triggered the present interest in automating operations," claims Alex Nedzel, managing associate at the Index Group, Inc., a Cambridge, Mass.-based information management consulting firm.

"Traditional minicomputer operating systems don't need much staff support, but MVS and VM do," Nedzel says. "So mid-range system installations have low support staff requirements. To compete in the mid-range, then, IBM can either develop low-support mid-range operating systems, or it can front-end its existing operating systems with automated operations capability."

### Paradox of Netview

Then there is IBM's Netview. The single-presentation structure that makes Boole & Babbage's Auto Operator products appealing is at the heart of Netview and at the heart of Netmaster, a similar product from Cincom Systems, Inc.

**MIS NEEDS to build software products to perform tuning because it does not want to use humans for the task.**

Both of these products provide a uniform presentation of all network components, including non-Systems Network Architecture ones, at a host-based terminal. Consequently, network managers can control the operations of the physical network from the same place they oversee the operations of the logical network. Thus, the network manager is alerted when service levels are not met and does not have to flip through multiple products to track down the problem.

Netview, which many regard as being more architecture and intent than actual product, is greatly responsible for the growing interest in automated operations. But it is also a hindrance to them.

"Netview is getting everybody interested in automated operations," says Howard Perry, director of Boole & Babbage's capacity management product center. "But it's also keeping people from committing to any given product because people are disappointed in it."

Software that automates routine operations simplifies the interface between the operator and the system. Boole & Babbage's IMS and CICS Auto Operators, for instance, automatically react to system messages and include a browsable message journal, operating system status display and terminal support. These tools, as well as an MVS Auto Operator now in development, can be used in tandem and appear to the operator as a single product.

"With Auto Operator, you don't have to remember IMS command syntax, and you don't have to really know what you're looking for to be an effective IMS problem solver," notes Wendy Eaves, an IMS systems programmer at Dallas-based Dresser Industries, Inc. and an Auto Operator user.

One action that many of the major vendors — including Computer Associates, VM Software, BGS Systems and Boole & Babbage — now or will soon take, is to offer capacity management systems in which knowledge-based expert system capabilities are embedded, a function particularly pertinent to automating operations. Expert systems are being used to resolve resource conflicts internally without operator intervention — so fast that response times of on-line transaction processing systems are not degraded.

### Forays into new territories

The same market dynamics that drive the interest in automated operations are generating interest in capacity management tools in new sectors, such as mid-range systems, networks and software development. In each of these sectors, the emphasis is on tools with knowledge about performance analysis and capacity planning.

**Mid-range systems.** "Look at what IBM is trying to do with VM/XA — their goal is to make it tuning-less," VM Software's Golden suggests. "IBM is changing what an operating system is." As with other potential automated operations, MIS needs to build software products to perform tuning in certain kinds of machines and environments because it does not want to use humans for the task.

The demand for a machine that does not need to be tuned extends beyond the IBM world. The stated purpose of General Research Corp.'s expert system-based VAX tuning tool, TIMM/Tuner, is to help system managers of the Digital Equipment Corp. product perform tuning tasks without outside help.

**Networking.** Since many networks have been constructed piecemeal throughout several years with equipment and software from a number of vendors, network managers struggle to maintain efficiency and responsiveness. In a world in which demand for networking is not abating, capacity planning is critical.

**Software development.** Testing new system applications or major enhancements to existing systems is so cumbersome and labor-intensive that capacity management software suppliers are providing products to streamline the process.

American Cyanamid Co.'s Shulton Division in Clifton, N.J., a provider of consumer products, used On-Line Software's

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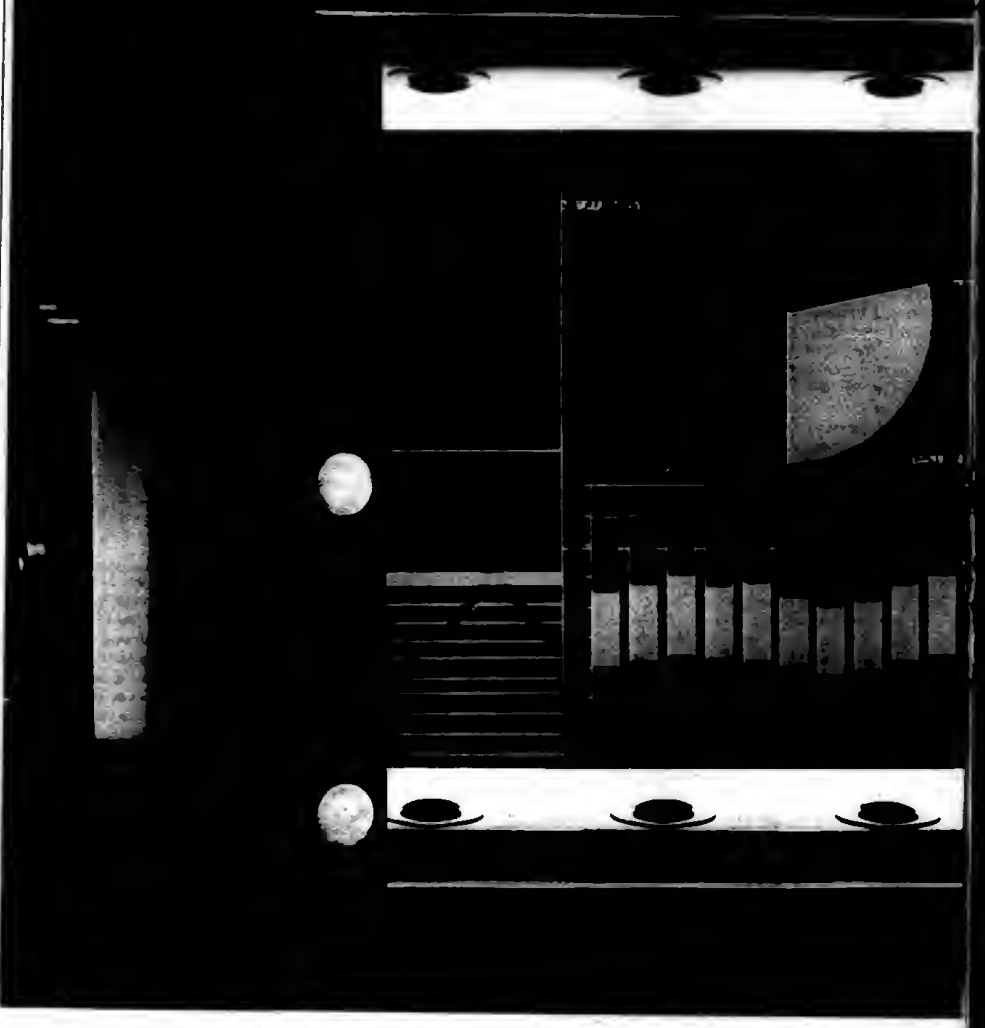

Verify, an automated CICS application testing tool, to ensure the quality of a new order processing and inventory control system called Clips.

When the time came to test Clips before it went into production, just one person was available to do the job, and three business groups with conflicting needs were suggesting software modifications.

"I did not want quality assurance to be a bottleneck for the development process," explains Bob Cottone, the division's manager of data center operations. So he successfully used Verify to do regression testing on the application; the software was used to document and research Clips' problems and bugs and to isolate, resolve and document program errors.

> "IT'S A WASTE of resources to seek precision in capacity plans with a horizon of more than six months. It's like measuring with a micrometer, marking the measurement with chalk and cutting with an ax."
>
> ALEX NEDZEL
> INDEX GROUP, INC.

Some obervers say they see little need for capacity management tools for software developers. "It used to be much more important for software developers to be aware of performance requirements than it is now," Index Group's Nedzel says. "But the resources that the software eats up are becoming so cheap as to be inconsequential."

Others differ with that opinion. "You prepare an application completely differently for a mainframe than you do for a distributed mid-range configuration. Different application designs perform differently," James McGuire, BGS Systems' vice-president of products and marketing, contends. "Specialized tools, based on expert system techniques, can tell developers how different application designs will perform."

### PC-based management

Most capacity management software still operates on high-end hardware. However, some argue persuasively for running capacity management software on PCs. Accordingly, a few products incorporating expert system technology are beginning to emerge.

Computer Associates' ISS-3 boasts an embedded knowledge base. General Research's TIMM-Tuner, built using that company's TIMM expert systems tool, comes in a PC version. And Princeton, N.J.-based Applied Data Research, Inc. recently announced Mindover MVS, an expert system-based performance tuning and capacity management product that runs on IBM PCs.

"You make performance problems worse when you run capacity planning software on the mainframe because the software is so resource-intensive," says Henry Steinhauer, an associate with the compensation and benefits consulting firm Hewitt Associates and Midwest chairman of the Computer Measurement Group.

Steinhauer, an early user of Computer Associates' ISS-3, says he saves time on a PC because he is not dependent on an overloaded mainframe. "If you're running toward the top of the user resource-intensity curve," he notes, "you're burning a lot of cycles as you go through all the permutations of the environment. But with a PC you don't have to make matters worse to make them better."

Those whose modeling needs are highly detailed — for instance, firms modeling very large systems — will find PCs limiting, Boole & Babbage's Perry maintains. "PCs are better for less technical, senior-level decision making users," such as long-range strategic planners.

Index Group's Nedzel adds, "The best capacity planner is close to users and uses a highly interactive modeling tool, for which the PC is extremely well suited. Unless you have very specific knowledge about what your system will be doing in a couple of years," he adds, "it's a waste of resources to seek precision in capacity plans with a horizon of more than six months. It's like measuring with a micrometer, marking the measurement with chalk and cutting with an ax."

### Role of expert systems

If capacity management's leading edge were to have a point man, it would be expert systems. It is important to realize that at this technology's heart is a software architecture or methodology that allows for a new kind of software functionality.

Generally, problem solving models are encoded in conventional software programs, but these models are implicit, and their knowledge is organized on only two levels: data and program. If knowledge is to be added to a conventional program, the entire program must be rewritten.

Expert systems, on the other hand, organize knowledge on three interacting levels: inference engine, knowledge base and data. The system's knowledge is developed and maintained separately from the rest of its programming.

The application of expert system architecture to specific, well-defined problems can result in software that, in the


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Because expert systems deal with uncertainty in both the knowledge they use and the solutions they derive, they can tackle problems of significantly greater complexity than conventional programs.

Conventional software tools that support capacity planning and performance management contain little or no knowledge about these processes. This lack has traditionally been made up by the analyst using the tools.

**BECAUSE expert systems deal with uncertainty, they can tackle problems of significantly greater complexity than conventional programs.**

By contrast, an expert system, the domain of which is capacity planning or performance tuning, can provide much of this knowledge.

"Expert systems have a proven capability to deal with diagnostic kinds of problems," notes Susan Messenheimer, president of AIM Publications, Inc., a market research and consulting firm in Palo Alto, Calif., specializing in artificial intelligence. "There's a lot of diagnosis to be done in performance management and capacity planning."

### Opening the door

In applying expert system functionality to capacity management — mostly in the form of expert system methodology embedded in conventional software products but sometimes in stand-alone expert systems — the door is opened not so much to new classes of applications but to new classes of users.

Because an expert system can be filled with knowledge about both the performance analysis and capacity planning concepts and the specific models of hardware, it is especially capable of helping comparative nonexperts properly interpret measurement and model results and guide the entire performance management or capacity planning process.

Expert systems are sometimes difficult to cost-justify. However, capacity planners and those concerned with performance management problems get off easy, because their problems are well suited to expert systems. In their case, the following criteria that qualify a problem for an expert system-based solution are met:

- Human expertise is limited, and education of new experts is difficult and expensive.
- The expertise is in demand.
- The problem at hand is well defined and solvable but also complex and not easily solved.
- The price of mistakes is high.

### Benefits and caveats

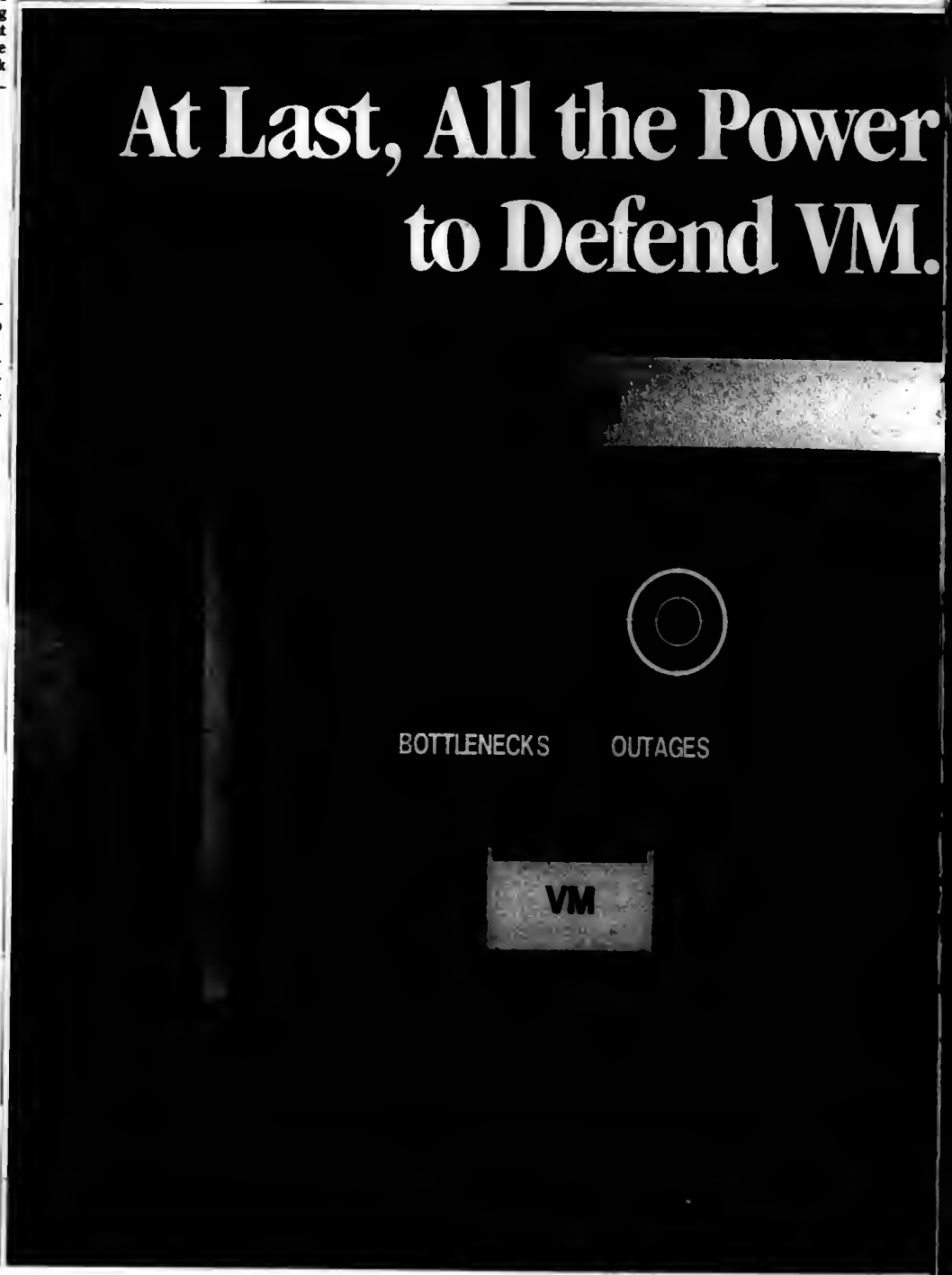
Huddie Dean, a performance measurement specialist at Chilton Corp. and an early user of Boole & Babbage's expert system-based DASD Advisor, says that product has saved him hours of time that would have been spent doing diagnostics.

Hewitt Associates' Steinhauer says, "What I accomplished in one day on a PC using ISS-3 would have taken me three or four days on a mainframe using software without expert system capability."

There are, of course, caveats attached to this technology. Some users and potential customers of expert systems express reservations about allowing an expert system-based product to automatically implement its recommendations. As smart as an expert system may be about performance analysis, it knows nothing about corporate politics, for instance, and its actions could turn out to be politically absurd.

One capacity planner laughs about the time his expert system recommended installing "so many solid-state devices to handle an overload problem that we could have single-handedly saved Storage Technology from bankruptcy."

Steinhauer observes, "People need to use expert systems



as advisers and apply the reasonability themselves. An expert system has the same pitfalls as all rules of thumb. But as an adviser, it makes you consider options you might not otherwise think of."

Another caveat concerns maintenance of the knowledge base. As the knowledge changes, an expert system's knowledge base must be changed, too. So knowledge base maintenance cannot be ignored, especially in capacity management, in which the knowledge base contains the ever-changing specifics about particular models of hardware and software products.

Some maintenance can be expected from the vendor; ISS-3's knowledge base, for instance, is updated quarterly. However, users will always need to contribute their own changes as the organization's understanding of its system needs and organizational goals evolves.

### One of your own

Most of the tools now available to build expert systems were derived from laboratory efforts to produce expert systems to handle diagnostic problems.

The following list illustrates some of the areas in which expert systems are emerging in capacity management. While some are available commercially, the majority are either experimental or proprietary and are not yet available in the marketplace.

**Operational control.** On a day-to-day, operational level, data center personnel have relatively little time to execute procedures and prevent problems. If they hesitate, the data center may not meet its service level agreements, and end-user productivity can deteriorate.

Several expert system-based products help data center and network management personnel maintain operational control by offering them data interpretation, recommendations for further action and sometimes automatic problem solving:

- DEC's Network Troubleshooting Consultant (NTC) is used internally by DEC's worldwide remote diagnostic centers. Reported problems, such as downtime or degradation analysis, are consolidated by the telephone support center; NTC supervises the diagnosis guidance programs.

NTC is installed on a VAX and may be linked to Decnet's management function to invoke testing procedures. Its knowledge base is tree-structured, so the possible reasons for any given problem are narrowed down by succeeding questions.

- IBM's Yes/MVS assists operators in monitoring and controlling MVS operating systems. The system helps operators interpret system messages, allocate resources, prevent shutdowns and remember users' priorities.

Yes/MVS runs on VM but has been reimplemented in Yes/L1, a rule-based extension of PL/I.

- Net/Advisor, from Avant-Garde Computing, Inc. in Mt. Laurel, N.J., is a network operator assistant. It works with Net/Command, a Netview-like network management product that coordinates the operator's access with many different sources of network data. The data is sent to the Net/Advisor expert system, which scans its knowledge base for rules that will be sent back to the operator for assistance in problem solving.
- AT&T Bell Laboratories' Troubleshooter coordinates troubleshooting activities in Datakit's large Centrex-style local-area networks. Unlike most expert systems, Troubleshooter can learn how to evaluate new problems.

**System and network administration.** System and network administrators negotiate with end users about service levels. When actual service levels meet the plan, reports on configuration status are generated. If not, a request for performance analysis and tuning is issued. Upon successful tuning or other

> THE MAJORITY of expert systems are either experiemental or proprietary and are not available in the marketplace.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changes, the inventory of hardware, software and vendors is recorded. If tuning proves to be of no help, capacity planners get involved, or service level goals are renegotiated.

Thus, system and network administrators deal constantly with segments of the capacity management data base. Expert systems can help the administrator with sophisticated windowing and screen controls, prompts for more data, answers to data base inquiries and confirmation of actions taken. Among the expert systems offering such help are the following:

- Avant-Garde's Net/Advisor maintains an updated configuration data base that includes properties, connections and monitored variables.
- DEC's NTC contains knowledge of configurations for given geographical areas.
- Bell Communications Research Corp.'s Switching Maintenance Analysis and Repair Tool diagnoses and maintains switches through its Operations Support System, which is centrally located and handles many switches.

**Data interpretation.** Part of performance analysis involves occasionally reviewing the output of data reduction and analysis instruments. But these instruments generate too much output on system and network performance for the analyst to quickly interpret or analyze. Expert systems can certainly make interpretation easier by automating it with rules for handling known procedures.

Performance analysts are typically asked to make qualitative judgments for which thresholds can be defined — for example, what constitutes "good" or "bad" performance. Even tougher is the quantification of the fuzzy realm between the thresholds; this is what expert system-based tools, such as the following, can address:

- Boole & Babbage's DASD Advisor, the first in a series of expert system-based performance advisers, targets the biggest service-level problems and recommends alternative solutions. Users can ask the system to explain its reasoning, which means the system functions as a de facto training tool.

**Problem management, performance analysis and tuning.** Preventing or correcting system and network outages is high on the capacity management to-do list. Many expert systems address fault diagnosis and make preventive maintenance recommendations. Among them are the following:

- DEC's AI-Spear diagnoses failures in tape drives and suggests preventive actions. Its CDX analyzes VMS dump files after system crashes.
- Lockheed Corp.'s BDS helps locate faulty modules in large signal-switching networks by using test equipment readings to isolate faulty printed-circuit boards or other parts.
- Travelers Insurance Co.'s Diag8100 diagnoses faults and recommends corrective measures for the firm's IBM 8100 computers.
- Prime Computer, Inc.'s DOC finds hardware and software bugs in the Prime 750 minicomputer by examining system memory to locate parity errors, irregular register values, faulty microcode and unterminated lines. DOC compares the state of the memory to a profile of known computer failures.
- Honeywell Bull, Inc.'s Permaid troubleshoots disk subsystem problems, handles subsystem preventive maintenance and helps systems recover from disk media errors.

> PERFORMANCE analysts are typically asked to make qualitative judgments for which thresholds can be defined. Even tougher is the quantification of the fuzzy realm between the thresholds; this is what expert system-based tools can address.

Short of encountering outright system crashes when performance monitoring data reveals problems or if operational or capacity planning staff request it, the MIS or data center staff will launch performance analysis and tuning efforts. Tuning demands that large amounts of data be interpreted, correlated and analyzed. Thus, there is a need for diagnosing performance bottlenecks as well as the causes of system failures.

While fewer expert system-based products are aimed at analysis and tuning problems than at crash diagnosis, such problems are an emerging area of concern. The following are some of the tools currently available:

- Boole & Babbage's DASD Advisor uses the data it interprets to do DASD performance analysis and tuning. DASD Advisor recommends actions and offers explanations for its recommendations.

Tim Barstow, a systems programmer at AT&T, notes, "There's a temptation to put in triple-density DASD without much performance information. This tool offers exactly the kind of help we'll need to deal with IBM's new triple-density DASD products."

- General System's TIMM/Tuner tunes DEC VAX/VMS computer systems. According to General System, the performance of the VAX computer on which TIMM/Tuner was developed rose 10% during the building and testing of the product.
- BGS Systems' Best/1 modeling tool, in which expert system capability has been embedded, can be used for performance tuning as well as capacity planning.

**Capacity planning.** Every computer system or network installation requires capacity planning — the process of understanding and predicting the performance of a system or network to maintain sufficient processing capacity.

The tools of performance measurement and data reduction, as well as performance prediction models and configuration guidelines, are all essential ingredients in the capacity planning process. What expert systems can add to this collection of tools is knowledge about capacity planning itself.

A capacity planning expert system contains encoded knowledge about computer performance analysis and capacity planning. This knowledge is required to properly interpret measurement and modeling results and guide the process to a goal consistent with the system or network users' service requirements.

Capacity planning is becoming an important expert system domain, and major software suppliers, such as the following, are embedding expert systems in their products:

- ISS-3's Capacity Planner component includes knowledge of IBM and compatible equipment and recommends configurations that meet user-established growth requirements and service level objectives.
- Best/1, running on MVS, is used primarily for capacity planning. Expert system-based versions for CICS and DB2 will be forthcoming by the end of this year.
- IBM's PEP38 is a capacity planning system for the System/38.

In addition, a growing number of expert systems have system and network configuration as their domain:

- DEC uses several expert systems to design and configure installations. The best known, Xcon, configures VAX systems.
- Honeywell Bull's menu-driven Intelligent Software Configurator automatically configures the DPS6 family of mid-range systems.
- NCR Corp.'s Ocean checks orders and configures NCR computers.
- BBN Communications Corp.'s Designet eases packet-switching network design.

### Where the limits lie

Clearly, most of capacity management's leading edge points to expert systems. But are there limits to these systems?

"If what you mean by 'expert system' is just procedural code that can do if-then tests, then there are real limits on what expert systems can do," Boole & Babbage's Perry contends.

"But," he continues, "if you require an expert system to have a distinct inference engine separate from its knowledge base, then there is virtually nothing an expert system cannot do as long as the domain is chosen well and you've got a knowledge engineer who can encode expertise into the knowledge base."

Some early users are already looking for more. "I'd like to see it do more what-if analysis," AT&T's Barstow says of Boole & Babbage's DASD Advisor. "I want to know, for instance, how certain actions might downgrade performance. Right now, I get advice about what to move but not where to move it. We need the systems to be smarter." •

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## INTERVIEW

# TEAMWORK BETTERS PLANNING

Pat Artis is president of the Computer Measurement Group, a worldwide, nonprofit trade association based in Alexandria, Va. He also operates his own consulting firm, Performance Associates, and is a leading authority in work load characterization, forecasting, simulation modeling and capacity planning. The author of more than 75 papers, Artis edits the "Journal of Computer Systems Science and Engineering." He spoke recently with *Computerworld* intern Jeff Goodwin about the misconceptions surrounding performance measurement and capacity planning and possible methods that could be used to integrate these functions more closely with business management.

**Do you think there's any validity to the criticism that current ways of measuring performance aren't really useful?**

I would not say they're not useful. The problem lies more with the fact that performance analysts have not learned to translate terminology into information meaningful to management.

Management wants to know more about what the systems are doing and how to estimate future resource requirements, and we're just not communicating that information effectively. The technology and terminology are fine. Where we are falling short is in restating our findings in terms that are meaningful for management.

**So there's a back-end problem, a lack of analysis and translation of data?**

The trouble is that we're hung up on exactness. The performance analyst or capacity planner says, "I can't exactly predict next year's work load, so I don't know how to give you a report." That isn't the way businesses work.

A company's pension plan is tied to the cost of living, and its cost of money is tied to the prime interest rate. Neither of these can be predicted with certainty in advance, but the comptroller doesn't say, "Our company is not going to have a budget for next year because I can't guess those values to two digits."

**What is the solution? Will there be tools developed to help integrate performance analysis with business planning?**

It's not so much tools that are needed as it is understanding. You have to understand that performance analysts aren't dumb, and they didn't make this problem for themselves. They had help from management.

When capacity planning started, management said, "This is a hard technical problem." And they went out and hired technicians — individuals who didn't necessarily know anything about the business — and put them in the basement and said, "Go solve this hard technical problem."

Tools aren't going to resolve the situation. What is needed is recognition of the fact that the capacity planner has to get out of the basement, find the users and develop ties with them.

This recognition is just beginning to develop and produce results. In fact, one of the most strikingly successful capacity planning programs I've seen in the last couple of years is one put together at a brokerage house in New York, where they took an MBA who had experience in corporate planning and assigned him two technicians who understood modeling.

**So you think the answer is to pair business managers with technicians?**

I truly believe that if it wasn't for what their paychecks said, 50% of all managers at all levels in all computing companies would just as soon be back writing code in the basement. Salary pressure has made managers out of a lot of good technicians.

The capacity planners are trying to grow and change. They are trying to learn how to talk to users and managers. But often, they just don't have the necessary business skills. One of the ways to get better results quickly is to find those skills elsewhere in the company — bring the technicians together with a business planning person and let them cross-pollinate.

**We are, in any case, facing a shortage of personnel who have the expertise needed to use complex monitoring and planning tools. Are performance software vendors going to be forced to deal with the complexity issue?**

I think most of them are desperately trying to do that. Certainly, there is a lot of talk now about expert systems.

The thing that worries me about expert systems is that, in turning to them, you run the risk of losing some very important fallback skills.

You have to understand that there has already been a loss of skills as a result of increased reliance on existing tools, that the people who understood all the processes because they had performed them manually are gone.

As soon as you have tools, the most natural approach is to say, "Let's go out and hire some people, and they'll learn through the tools." And the person who has learned to use the tools is well suited to deal with about 80% of all problems but ignorant about the other 20% — the problems that the product doesn't solve either.

**So you don't believe expert systems would improve the process?**

Expert systems can improve it, but what we have to recognize is that expert systems have limits, and the more we depend on them, the less prepared we will be to deal with the problems that crop up beyond those limits.

**With the life cycle of systems as short as they are now, how is long-term capacity planning possible?**

That's an interesting issue.

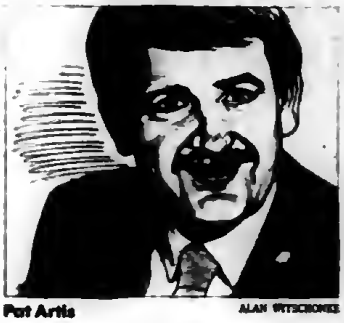
Today, the half-life of equipment is probably inching down to 30 months, maybe 24 months, and the capacity planner often has to work within constraints that leave very little room for maneuvering. There is a certain financial inertia built into the data center, with leases and depreciation schedules. In fact, that's one of the reasons that communication and willingness to make projections is becoming such a critical part of capacity planning.

The capacity planner has to be able to provide realistic life cycle expectations on pieces of equipment to the people doing financial acquisition and financial management of the equipment.

**Do you expect the trend toward integrated packages to continue?**

I don't see a lot more integration taking place. I do expect that the boundaries between the products will be very formalized, so that you will be able to slide between them very easily.

The performance-product marketplace has matured significantly during the last five to seven years. A number of companies have developed product offerings that are very comprehensive, but what these companies have found is that they reach a certain point beyond which they cannot penetrate.



Pat Artis — ALAN WITSCHONKE

Users don't want one product that can do everything: they want the freedom of using several products that will work together.

Take Morino Associates and BGS, for example. Morino Associates has a product called MICS, which deals with all measurement data and does accounting and capacity planning — up to a boundary — and performance and reporting of all types. They've totally integrated their marketplace.

BGS, on the other hand, has a product called Best/1, which it has integrated across VM, SNA, MVS and across new product offerings like DB2. If you took their customer lists and put them side by side, there would probably be an 80% overlap.

The users of these products aren't interested in a single-vendor solution. What they've wanted for some time, and what they are now starting to get, is not a total solution from one or the other vendor but accommodations from both vendors that will allow the products to work together.

So the likelihood that anyone's going to come in and succeed with a do-everything package is relatively small. ●

# The picture gets clearer with modeling

Many capacity planning and performance management products use a variety of models, including historical trend projections, benchmarking, simulation studies and analytical models based on queuing theory.

Modeling is used primarily to predict the performance of computer systems, but it can also be used to determine performance parameters that are inaccessible, inconvenient or too expensive to directly measure.

Trend projections are limited in that they merely extrapolate from past experience what future events — such as new kinds of systems — will ultimately defy. Benchmarking, on the other hand, uses an example configuration, which means variations are not considered.

Simulation and analytic modeling allows any number of present or future configurations to be tested. While simulation techniques are often more accurate than analytic ones, they take longer to execute and require the user to establish in advance the configuration being tested. Analytic models offer users the opportunity to determine the configuration they need, given their chosen performance parameters.

**TREND projections are limited in that they merely extrapolate from past experience what future events — such as new kinds of systems — will ultimately defy.**

### Models in combination

Sometimes using several models is worth the effort.

For instance, the performance model used in designing and testing the Federal Aviation Administration's (FAA) advanced automation system, the world's largest command and control system, has three components: a software model, a work load model and an analytic, or queuing, model.

Analytic, or queuing, models offer a launching point for understanding system performance, even if the ultimate explanations of performance problems cannot be precisely retrofited to them.

Like so many mathematic disciplines, queuing theory traces its origins to something practical — in this case, the study of the flow of events.

Queuing models help performance analysts make decisions about the systems they are planning or tending, since the models describe relationships between the events that comprise system or network operations.

The single-server queue is the basis for models of mainframe systems. Network modeling is similar, but it tends to get more complicated because of factors like inbound synchronization delays and cluster controllers.

### Rules of the game

A number of rules can help analyze modeling factors such as performance.

The utilization law, for instance, says the utilization of a resource is the product of CPU throughput of that resource multiplied by the CPU service interval at that resource.

Another law, called Little's law, is a modification of the utilizatioo law. It contends that in a steady-state environment, the product of a system's throughput multiplied by the average time spent in the system by a user's request yields the number of requests in the system at any particular moment.

The forced-flow law addresses throughput and service for various servers. This modeling law states that for all of the components in a aystem, throughput rates remain proportional to one another.

The Markovian M/M/1 birth and death process is used to figure how much time a user request will be in the system and the number of requests there are in a system queue. The M/M/1 model describes how, with utilization growth, a small increase in utilization corresponds to a large increase in total time in the system.

This means overloaded systems running at an 80% to 90% utilization level are much more sensitive to work load increases than systems functioning at 60% utilization.

### Inexact, but helpful

Real computer systems and networks deviate from the formulas these and other capacity planning models represent.

The performance model used with the FAA's advanced automation system, for instance, is required to have an accuracy rate of 20% for response times and utilizations, which developers felt was compatible with other system uncertainties.

Although performance modeling is by no means an exact science, it certainly helps performance analysts understand and anticipate performance results.

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# VENDOR VIEWPOINT
# Separating performance from planning

BY H. FRED SILVER

Many people, including some capacity planners, think capacity planning is just an updated buzzword for performance evaluation. That is a serious misconception. There are, or should be, distinct differences between the two.

Even when a structure has been created under the capacity planning banner, considerable uncertainty often lingers over some or all of the following issues:

- What needs to be accomplished.
- What to do to meet goals.
- What to expect.
- What tools are available.
- What results can be produced.
- Who is the beneficiary of the results.

The problem is that capacity planning and its derivatives have become popular panaceas. Many organizations try to implement the capacity planning function without really understanding what it is or what it requires, simply because they believe it is "the thing to do."

A recent conversation with the newly appointed manager of capacity planning at a large, well-known data processing company provides a good example of putting structure before understanding.

This person, having been handed a new title and a vague outline of his responsibilities, was calling for help in defining the job he was expected to perform. He had, he said, no idea what this function was or how to write a set of objectives for it, and, furthermore, he wasn't sure what his management expected. During the course of our discussion, several specific questions and issues were raised:

- Can the performance analyst and capacity planner be the same person? Should they be?
- Can they be on the same team? Again, should they be?
- Do capacity planners need to be highly technical, or can they possess average technical ability?
- Should capacity planners be concerned with today's performance, future performance or both?
- Should the capacity planner report to technical managers (line function) or to higher level managers (staff function)?

This manager was astute enough to sense what many organizations and individuals still do not — that capacity planning should be something more than just an extension of performance evaluation activities.

### Critical distinctions

There is no question the two functions are related, but there is more distance between them than is commonly assumed.

Performance evaluation is the process of understanding, optimizing and tuning the environment already in place. Capacity planning is the process of determining the resources that are needed to satisfy anticipated requirements. It is generally directed at solving specific DP problems or tuning the performance of existing hardware, software and applications environments.

Capacity planning takes a broader view. Its only interest in current performance is as a starting point for projections about future requirements.

Because many assumptions must be made and guesswork done to project performance and resource demands, capacity planning does not require the same degree of precision as performance evaluation. When dealing with projections, accuracy is measured in ranges of percentages rather than in fractions of seconds.

Not surprisingly, the two disciplines require different skills and temperaments. Performance analysis is essentially a low-profile support activity. Its practitioners tend to be technically oriented, proficient with tools and utilities. On the other hand, capacity planning offers the potential for high visibility, because the results of capacity planning studies usually support top management's decisions.

Capacity planning requires fewer technical skills than performance evaluation does, but it also demands a broader knowledge base. Capacity planners must understand the organization and its goals, as well as how to relate these goals to practical matters, such as software life cycle management and software performance engineering.

True capacity planning is very different from performance evaluation. Simply changing a title or creating a new slot on the organizational chart will not transform performance numbers into plans for the future. •

Silver is vice-president of Performance Systems, Inc., an organization that assists its customers in performance evaluation and capacity planning.

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**Pilot/CICS**
Formats mainframe data for transfer to the personal computer and utilizes Lotus Development Corp.'s 1-2-3 to perform CICS tuning, modeling, analysis and forecasting. Measures systemwide statistics as well as various response-time statistics. Allows comparison of projected work loads for different CPUs, dispatching priorities, disks and main storage types.

**Pilot/MVS**
Formats mainframe data for transfer to the PC and utilizes 1-2-3 to perform MVS graphics analysis, tuning, tracking and predictions. Provides resource management facility summary, work load, direct-access storage device, TSO summary and channel reports.

**BGS Systems, Inc**
**(617) 891-0000**
**Best/1 MVS**
Predicts the effect on systems response time and throughput of specific operating system or hardware equipment changes. Uses MVS monitored data as well as its own performance data base of IBM (or plug-compatible) equipment to build models that accommodate performance timing and capacity management needs.

**Best/1 VM**
Performs same functions as above product within VM environment.

**Best/1 SNA**
Performs same functions as above products within an IBM Systems Network Architecture environment.

**Crystal**
Predicts the IBM mainframe capacity requirements of any proposed new application. Uses an application description from the user and its own subsystem libraries for IMS and CICS as input.

**Boole & Babbage, Inc.**
**(800)538-1893**
**Model 300**
A performance/capacity planning software package that measures application resource consumption, performance bottlenecks, work load growth trends, impact of new work loads and effects of upgrading direct-access storage device or processors. It also projects CPU capacity saturation point. Actual system performance used to automatically verify baseline model.

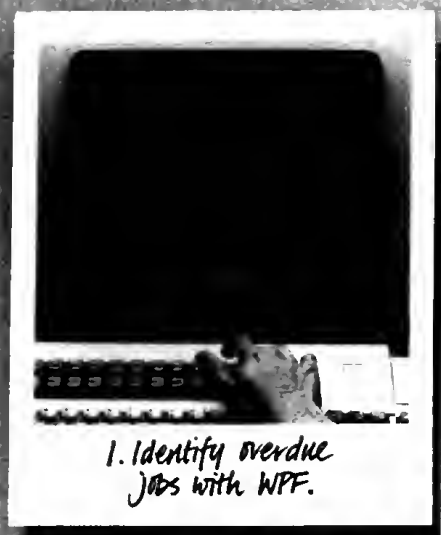
**Computer Technology Associates, Inc.**
**(703) 848-2700**
**Performance Analysis Tool Box**
A performance analysis tool that allows representation of centralized and distributed computer architectures. It can be used to model packet- and message-switched wide- and local- area networks.

**Datametrics Systems Corp.**
**(703) 425-1006**
**Capacity/Q**
A personal computer-based tool that models multiuser systems to determine need for more resources. Predicts how a particular work load increase will affect overall system performance and when hardware upgrades will be needed. Model outputs include utilization levels, batch throughput and turnaround times.

**Information Builders, Inc.**
**(212) 736-4433**
**Focus Design Analyzer**
A data base design analysis and simulation tool that runs on IBM VM/CMS or MVS/TSO. Allows user to prototype data base designs and forecast the effects of worst-case scenarios. Simulates relative data base I/O and disk space of proposed data base designs and populations from existing or planned structures.

Important Breakthroughs From Candle

Get Solutions To Complex As Easy As



Once it. We've got a tough job. It's not easy to maintain overall system productivity and manage an ever increasing number of individual jobs. But now you can optimize your resources to do both—if you've got the latest release of Candle's MVS performance products.

Breakthough features in this integrated family of products make it as easy as 1,2,3 to find out which resources are impacting MVS and impeding system performance. So you can take action fast and avoid customer complaints.

WPF

Workload Profiling Facility (WPF)™ of [illegible] automatically warns you about a job that's taking longer than usual. So you can identify a production job in trouble and take action before customers complain or deadlines are missed. What's more, WPF actually acts your job thresholds for you.

Resource Impact Profiles

A second breakthrough tool called Impact Profiles

**Information Research Associates**
**(512) 474-4526**
**Performance Analyst's Workbench System**

A simulation language for performance modeling of computer software, hardware, communications and electronic systems. A high-level declarative language for performance-oriented design and analysis, it runs on most systems that have a Fortran compiler. A graphical front end, GPSM, is available.

**Morino Associates, Inc.**
**(703) 734-9494**
**MICS MVS Model Generator**

Used in conjunction with the MICS base product. Provides automatic model generation of CICS, IDMS and IMS work loads, a standard interface for generating work loads from MICS user components and interfaces to standard analytic modeling packages. Includes facilities for modeling TSO work loads and handles multisystem configurations. Reports estimate the CPU capture ratio and direct-access storage device service time allocation for each work load.

**MICS MVS Performance Management**

Used in conjunction with MICS base product. Provides batch work load analysis function for work load characterization and batch-initiator modeling for evaluating proposed job classes and initiator structures.

**MICS MVS Capacity Planning**

Used in conjunction with the MICS base product. Provides work load analysis, a capacity planning data base and work load forecasting techniques, including profile and trending, simple and multivariate regression, univariate modeling for linear and nonlinear models and business-element forecasting.

MVS P
1, 2, 3.

3. Identify programming statements consuming CPU.

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recently changed

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MVS performance
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—or those in CICS, IMS, or
as 1, 2, 3.

Candle
Candle Corporation
9999 Bundy Drive, Los

**Pallas International Corp.**
**(408) 923-5509**
**Lead Time**

Assists in capacity planning of large direct-access storage device (DASD) farms by mathematically modeling regular DASD and cached disk controllers and solid-state disks. Multiported DASD and dynamic path-selection configurations, DASD load skew, shared DASD and path contention represented. Includes split-screen, model check function, symbolic variable input and ability to save results in Data Interchange Format or ASCII.

**Myriad**

A set of models grouped under a single interface. Models include probability distributions, simple infinite and finite queues, networks of queues, multiclass loss and bandwidth sharing. Includes the same features as previous product.

**Straight Line**

Models communications networks and production lines to avoid potential blocking caused by finite buffers. Handles up to 20 stations per network and does reports, such as transit time per network or node, long-run unit distributions per station and joint behavior of stations. Includes the same features as previous products.

**Performance Systems, Inc.**
**(301) 762-0300**
**Scert II**

A capacity planning and performance evaluation package that simulates how work loads will perform in hardware, software and communications environments. Permits automatic and manual input modeling through interactive input processor.

**Performix Software Corp.**
**(415) 969-3399**
**Network Performance Expert**

A personal computer-based software system that provides performance analysis, capacity planning and design evaluation through the use of analytical queueing models. Can be used with large telecommunications networks or small configurations.

**Spectrum Concepts, Inc**
**(212) 766-4400**
**Spacecalc**

A capacity planning aid that performs VSAM file modeling to project direct-access storage device (DASD) requirements prior to allocation. Projections computed for both data and index components of files and include DASD storage in tracks and cylinders, percentage of the device occupied, logical mapping and distribution of free space. Modeled VSAM cluster can be allocated dynamically by the user.

**Technetronic, Inc.**
**(613) 727-5681**
**The Explicit capacity planners**

Two interactive tools that produce both tabular and graphical reports. MVS planner predicts effect of CPU upgrading, changing MPL, modifying I/O subsystems and adding users, cache devices and new work loads. IBM Systems Network Architecture planner predicts the effects of switching from binary synchronous communications to Synchronous Data Link Control, changing NCP parameters, switching multisystem network facility lines, upgrading line speeds, rerouting or increasing traffic.

# Users learn dollars and sense

BY PHIL HOWARD

A class of proprietary software products, generally called job accounting packages, calculate dollar charges for computer resource use by applying rates to measured system usage. Users are then charged or invoiced for the amount of services used.

Chargeback is not a prerequisite to capacity management, but it does place the responsibility for accurate forecasting where it belongs — squarely on the shoulders of the end user. Good forecasts are essential to good capacity planning. When users have clear budgetary responsibility for computer resource use, they tend to behave in a more rational, economic way. This helps make the capacity planning process much more accurate and dependable.

When chargeback is used, it establishes feedback between MIS and users. It encourages more effective use of resources and removes politics from resource allocation. It promotes end-user involvement in basic MIS decisions as well as greater efficiency within MIS itself.

This method of charging differs from cost accounting in that the latter identifies and accumulates costs relating to the MIS function and allocates these costs to work centers. The function of chargeback is to translate these costs to rates, or cost per unit of usage, apply pricing strategies and compute user charges based on those rates.

**Which method is right?**

Generally, the decision of how to compute user charges becomes a choice between an algorithm-based method and a business unit-based one.

**CHARGEBACK places the responsibility for accurate forecasting where it belongs — squarely on the shoulders of the end user.**

The algorithm-based method, which is used by most job accounting packages, applies dollar rates to measured use to arrive at a charge based on actual resource utilization. MIS must decide which resources to apply to arrive at the charge and how to measure their use and compute associated costs.

An approach based on business units applies a standard cost to a unit of activity such as number of accounts, transactions or invoices. It is much easier to communicate to the user community with this method than with the charging algorithm, since users relate more naturally to the concept of business units.

A bank branch manager, for example, may have a good idea of the number of accounts at his branch but almost no understanding of what this might require per month in the way of CPU time. If he knows the cost per account, he can budget for computer service easily.

The business unit approach is far more simple and eliminates the variability in charging that often occurs with an algorithm-based approach. However, few organizations now use it successfully, largely because arriving at an appropriate charging unit is sometimes difficult.

MIS personnel does not always think of the chargeback approach to measure service. But just as poor response time can cause user dissatisfaction, unsubstantiated or apparently excessive charges are just as disturbing after services have been rendered. ●

Howard is president of Applied Computer Research, Inc. in Phoenix.

# Better performance through engineering

BY CONNIE SMITH

Software performance engineering (SPE) is a method of constructing software systems to meet performance goals. It uses the standard engineering practices to assess, before construction, the correctness, feasibility and desirability of software designs.

In SPE, the user models software requirements and designs and evaluates whether the predicted performance parameters meet specified goals. The process continues through the detailed design, coding and testing stages to more precisely model the software and its predicted performance and monitor actual performance against predictions.

**USERS' perceptions of DP services are often based more on system responsiveness than functionality.**

The goal is to maximize response time or throughput as seen by users. Responsiveness dictates the amount of work that can be processed, so it determines a system's effectiveness — both perceived and real. Users' perceptions of DP services are often based more on system responsiveness than functionality.

While SPE focuses on software development, it is also an important aspect of capacity management. Accurate planning requires resource consumption estimates for new applications and for the effect of current work growth on computer resource requirements. SPE provides both.

It assists the capacity management effort by making it possible to examine the costs and benefits of resolving imbalances by increasing system capacity instead of modifying the software requirements or designs.

### Models support planning

Modeling tools are the primary products that support capacity planning.

Planning for growth in existing systems uses parameters from measurement data combined with demand projections. For new software systems, parameters come from software execution models, which are usually developed in SPE performance walk-throughs.

These models can be created with a calculator, spreadsheet, statistical analysis package or customized program. Commercial products are also available for simulating execution or analytically examining software models to produce system model parameters.

Commercial products for creating capacity planning models with simulation or analytic methods are currently used to predict new software performance and quantify resource requirements and the competitive effects of new software on existing systems and vice versa. Some commercial products combine the software models with the system models.

Model results are limited by the precision of the input parameters, however. Performance specifications for new software systems are seldom precise, so it is crucial to monitor software as it evolves and compare measured performance with predictions.

The SPE process currently requires several products. No single product offers all of SPE's functions. Some provide early performance benchmarks. Others measure and report key performance indicators. Still others report response time and resource usage to software code.

### The missing tools

Many products currently support SPE tasks, but none provides an ideal combination of features. In the future, integrated products will make SPE much easier.

Data collection instrumentation will be integral to new software systems. Collection will be automatic; measurements will be automatically related to software models, and discrepancy reports will be automatically generated.

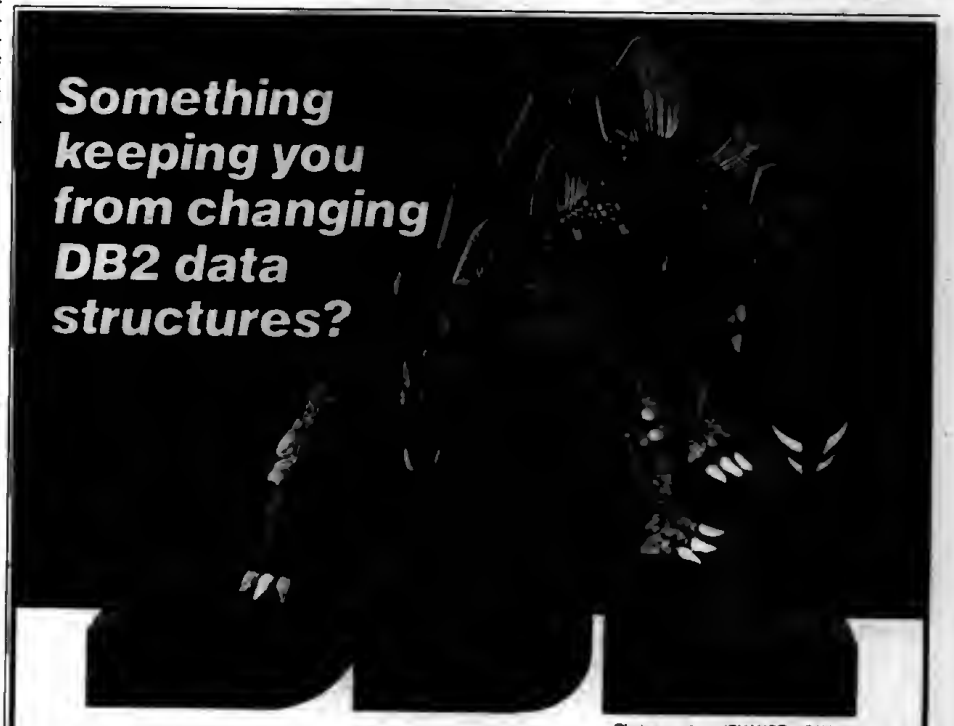
Expert systems will also play a larger role in SPE in the future. In the near term, they will detect performance problems and their causes. Later, they will examine software requirements, designs and programs and suggest improvements.

Products to support SPE are necessary but not yet sufficient. They are needed to automate the tedious and error-prone analyses, because timely results are vital.

However, the goal of SPE is not to produce analysis results — it is to develop a system that meets performance goals with reasonable computer capacity. To be successful, a performance engineer also needs to be proficient in SPE methods. With the products and skills, it is easy to build performance into new systems. ●

Smith, a performance engineering consultant based in Santa Fe, N.M., is a principal of L&S Computer Technology, Inc. in Austin, Texas.

Something keeping you from changing DB2 data structures?



Changeasaurus—(CHANGE-a-SAU-rus)

It's not that you can't make a change; it's what happens when you do make a change. Changeasaurus, that jealous guardian of the DB2 catalog, is dangerous when provoked. Because of the demands of Changeasaurus, DBAs have spent upwards of 50% of their time battling complex change procedures.

But those days are gone. Now there's DB2 ALTER from BMC Software, which supports all changes to attributes of objects. DB2 ALTER automatically restores data, dependencies and authorizations. It features commit-point control and restart capability, and Rename, Migrate and Create Like commands.

DB2 ALTER provides:

- Complete control of the change process
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# Performance monitoring tools

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABC Technology, Inc. (415) 886-6640 | ABM Disk Tracer | Unix | File usage and disk I/O | Unix systems with standard System V file system | Monitors and analyzes file usage, generates tracking reports, develops and implements layout strategy | Yes | I node activity, interleave, access activity histogram, predicted performance histogram, cylinder access analysis report | Yes | No | Yes | I node activity report, interleave report, access activity histogram, performance histogram, cylinder access analysis report | No | No | Contact vendor |
| | ABM Job Scheduler | Unix | Program usage | NA | Monitors program usage, automatic scheduling tasks | Yes | Scheduler queue reports, scheduling statistics reports, daily job history | No | Yes | Yes | Scheduler queue, scheduling statistics, daily job history | No | No | Contact vendor |
| | ABM Job Accounting | Unix | Resource usage | NA | Monitors login time, CPU time and disk usage; tracks resource usage by users and groups of users; builds usage information data base; generates usage and chart statements | Yes | Prepared by customers, users, time periods | No | Yes | Yes | Resource usage data base | No | No | Contact vendor |
| | ABM Benchmarks | Unix | Functional characteristics and applications | NA | Monitors, measures and reports performance | Yes | Functional benchmark results, application analysis results, response time analysis | Yes | No | Yes | Data bases and reports | No | No | Contact vendor |
| Allen Systems Group, Inc. (513) 832-0154 | Shopmon | MVS/XA, MVS/SP | MVS, Cullinet IDMS (monitors both simultaneously) | Any system running MVS | MVS, MVS wait and MVS exception analysis, IDMS analysis, IDMS exception analysis | No | NA | Yes | Yes | Yes | Records statistical information used in capacity planning | Yes | No | $18,250-$29,600 (depending on configuration) |
| [illegible], Inc. [illegible] 470-0419 | Asset2 | MS-DOS | Industrial measurement sensors | IBM PC, XT, AT and compatibles | Data acquisition, process control, graphics displays, trend plots, system efficiency analysis | No | NA | Yes | Yes | Yes | Plotting and analysis of real-time process variables | Yes | 1-2-3, Symphony, any ASCII file, Allen-Bradley protocol | $395-400 |
| Applied Data Research, Inc. (201) 874-9000 | Look | MVS/XA, DOS/VSE | Operating system, teleprocessing monitor (CICS), batch jobs, DBMS performance, Roscoe (on-line programming system) | IBM mainframe | Real-time performance measurement, threshold monitoring for early warning, extended historical analysis, graphics reporting, customization | Yes | Summary reports of statistical findings, histograms and point plots | Yes | Yes | Yes | No | No | Proprietary | $35,000 (MVS), $12,000 (CICS monitor), $18,000 (VSE version) |
| [illegible] Inc. (818) 340-3000 | Flash/VS | OS, MVS, MVS/XA, CICS | MVS, MVS/XA | IBM mainframe, PC with 3270 and file transfer capabilities | Downloads information/data for analysis on PC, analyzes RMF data directly from system data sets for reporting and tracking, tunes MVS by workload, provides graphics presentations | Yes | RMF summary, workload, DASD, TSO summary, demand | Yes | No | Yes | Through workload reports, RMF summary reports | No | Reads all releases of RMF and SMF data | $5,000 |
| | Flash/CICS | OS, MVS, MVS/XA, CICS | CICS performance | IBM mainframe, PC with 3270 and file transfer capabilities | Downloads information/data for PC analysis, analyzes CICS data for reporting and tracking, tunes CICS, generates CICS by region using an analytic model, models complex CICS environments | Yes | Summary reports, response time | Yes | No | Yes | Model generators, simulation | Yes | — | $5,000 |
| Bear Computer Systems, Inc. (800) 255-0662, (818) 508-1894 (Calif.) | I-mon | VMS | Applications processes | DEC VAX | Collects CPU usage data on any currently running process; monitors displays at runtime or in batch, displays data according to variety of qualifiers | Yes | Histogram by routine, detail histograms by line number within a routine, CPU modes for single process, scheduling states for single process, page faults by routine | Yes | Yes | Yes | Measures the impact of a single process | Yes | No | $500-$9,000 (depending on configuration) |
| | F-mon | VMS | System service calls made by the program | DEC VAX | Intercepts and prioritizes all system service calls, generates reports of intercepted calls, modifies system service calls from outside user program | Yes | Detail and brief reports by selective service | No | Yes | No | Analysis of individual program's use of resources | Yes | No | $500-$9,000 (depending on configuration) |
| | Virtual Disk | VMS | Disk I/O | DEC VAX | Records individual disk I/Os | Yes | Individual disk I/O reports | No | Yes | No | No | Yes | No | $500-$9,000 (depending on configuration) |
| | E-mon | VMS | Ethernet | DEC VAX | Shows Ethernet operations and statistics to all nodes, shows histograms of packet sizes and spacing, shows protocols, introduces a known load | Yes | Histograms, summaries, detail reports, dynamic reports | Yes | Yes | Yes | Analysis of data and ability to introduce known loads | Yes | No | $500-$9,000 (depending on configuration) |
| | D-mon | VMS | Disk usage | DEC VAX | Generates on-line alarms for low disk space and reports on disk usage by directory tree, reports history, assists in creating disk quotas | Yes | Directory tree with summary, history, largest file | Yes | Yes | Yes | History reporting | Yes | No | $500-$9,000 (depending on configuration) |

[1]Resource Management Facility [2]Direct-Access Storage Device [3]System Management Facility [4]Systems Network Architecture [5]Initial Program Load

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.

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| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BGS Systems, Inc. (617) 891-0000 | Capture MVS | MVS | MVS work load | IBM mainframe | Measures daily usage using SMF and RMF data, shows how each application uses system, shows detailed view of I/O subsystem, presents reports and graphs for system-wide use, builds model for Boot/1 | Yes | Shows resources consumed by each application for each system component | Yes | No | Yes | Aids in capacity planning | Yes | Proprietary | $10,000-$12,000 |
| | CICS Support Feature | MVS | CICS | IBM mainframe | Uses CICS monitor data to show detailed transaction performance, shows how each CICS transaction uses system components, characterizes work loads consisting of aggregations of CICS transactions, builds CICS models for analysis | Yes | Detailed and summary reports of CICS transactions | Yes | No | No | Aids in capacity planning | Yes | Proprietary | $8,500 |
| | Capture VM | VM | VM operations | IBM mainframe | Uses CICS monitor data to show detailed transaction performance, shows how each CICS transaction uses system components, characterizes work loads consisting of aggregations of CICS transactions, builds CICS models for analysis | Yes | Shows resources consumed by each application for each system component | Yes | No | Yes | Aids in capacity planning | Yes | Proprietary | $10,000-$12,000 |
| | VM Applications Planner | VM | VM/CMS applications usage | IBM mainframe | Monitors VM/CMS applications usage, shows system resources consumed by each application, provides real time view of applications currently active, builds reports and graphs showing applications use of system resources and models for Boot/1 | Yes | Graphs and charts of VM/CMS applications | Yes | Yes | Yes | Builds model for Boot/1 | Yes | Proprietary | $7,000-$8,000 |
| | Capture SNA | MVS, VM | SNA* networks | IBM mainframe | Monitors network response time and throughput for SNA networks, monitors performance for each network component, reports network-wide performance, builds model for Boot/1 | Yes | Response time and throughput for SNA network charts | Yes | No | Yes | Builds model for Boot/1 | Yes | Proprietary | $25,000-$45,000 |
| B. I. Moyle Associates, Inc. (612) 933-2885 | BIM-ODIS | DOS/VSE, OS/MVS | CICS system status display program | IBM mainframe | Display of current status of operational CICS system and many OS and DOS system control areas, detail and summary displays, analytic displays for problem determination | No | NA | Yes | Yes | No | On-line CICS system status display | Yes | Yes | $4,800 (OS permanent license), $2,400 (OS annual lease), $2,800 (DOS permanent license) $1,400 (DOS annual lease) |
| | BIM-MONTR | DOS/VSE | System status performance and power queue display | IBM mainframe | Displays internal system performance variables (paging rate, CPU utilization, device I/O accounts), displays current system and partition status, power queue entries, passes queue alteration commands to power | No | NA | Yes | Yes | No | Displays internal system performance variables, displays current system and partition status, power queue entries | Yes | Yes | $1,200 (permanent license), $600 (annual fee) |
| Blue Line Software, Inc. (612) 642-1072 | Vital Signs | VM | Hardware in the operating system | Any hardware supporting VM operating system | Real-time and historical reporting, DASD modeling, data extraction to SAS, DASD seek analysis, mass facility, computer monitoring | Yes | Tabular reports, plots | Yes | Yes | Yes | Trend analysis, statistical analysis | Yes | Extract and feed data into SAS, Lotus 1-2-3 | Contact vendor |
| BMS Computer, Inc. (415) 935-2620 | CIMS | MVS, VSE | Job status | IBM mainframe and compatibles | Job step monitoring, device usage reports, form management, data set utilization, multiprogramming | Yes | CPU usage; disk usage; I/O utilization; daily, weekly and monthly utilization; end-of-job | No | No | Yes | No | No | No | $9,500 (MVS), $7,500 (VSE) |
| Boole & Babbage, Inc. (408) 735-9550 | Resolve Plus | MVS, MVS/XA | MVS performance | IBM 4300 | Warns of system problems, reduces operations time and errors, reduces scheduled IPL, encourages rapid problem resolution, increases operator productivity with MVS-like utilities | No | NA | Yes | Yes | No | No | No | No | $19,000 (MVS), $24,000 (MVS/XA) |
| | CICS Manager | DOS/VSE, MVS, MVS/XA, CICS | CICS performance | IBM 4300 | Displays warning when service levels are not meeting user-specified thresholds, corrective action can be initiated on-line to ensure immediate results, separate subtasks queue operations, flags files with high task waiting times | Yes | Build-your-own batch reports | Yes | Yes | Yes | No | No | MICS | $8,000 (DOS/VSE), $16,500 (MVS) |
| | IMS Management Facilities | MVS, MVS/XA, IMS/VS DB/DC | IMS performance and resources | IBM 4300 | Increases system availability, automatically responds to IMS problems to prevent service degradation, warns of high resource utilization levels, monitors multiple IMS systems from one terminal, graphics data display | No | NA | Yes | Yes | Yes | No | No | CMF Monitor, MICS | $15,000-$34,000 |
| Business Computing Design (312) 990-0000 | Manage-Mint | SSP | Disk and memory utilization and analysis | IBM System/36 | 25 screens and reports to improve resource and disk management; shows how to balance files properly across disk drives | Yes | 25 screen and hard-copy reports | Yes | Yes | Yes | Disk usage analysis vs. what is allocated | No | No | $950 |

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Candle Corp. (213) 207-1400 | Deltamon | MVS SP/1, SP/2 (XA) | Changes to system software, operational procedures, hardware configuration, load libraries, specified data sets | IBM CPU and compatibles capable of running MVS | Identifies unplanned, unauthorized or accidental changes affecting system performance; verifies implementation of planned changes and provides an audit trail; when performance problems occur it determines "what changed" | Yes | Change summary, current status of any monitored resource, status changes of any monitored resource | No | Yes | Yes | No | No | Epilog/ MVS (proprietary) | $15,000-$17,000 |
| | Epilog 1000 for CICS | MVS SP/1, SP/2 (XA), DOS/VSE, SP | CICS | IBM CPU capable of running CICS, MVS/SP1 or SP2 | Reports on service levels and resource utilizations with data collection and support for MRO/ISC | Yes | More than 36 user-selected reports | Yes | No | Yes | Yes | No | Includes conversion utility to support software that requires IBM CMP format data | $2,000-$6,000 |
| | Epilog for MVS | MVS SP/1, SP/2 (XA) | Service levels, resource utilization, sources of contention for TSO, batch jobs, started tasks | IBM CPU and compatibles capable of running MVS, 100-150 cylinders of 3380 DASD | Automatic navigation from service levels to resource contention and utilization via batch reports on interactive inquiry | Yes | More than 36 user-selected reports | Yes | No | Yes | Through SAS interface | No | SAS interface | $19,500-$24,500 |
| | Epilog for IMS | MVS SP/1, SP/2 (XA) | IMS Release 1.3 and higher | IBM CPU and compatibles capable of running MVS | Monitors service levels, resource utilization and sources of contention for IMS work loads; automatic navigation facility speeds, analysis of complex performance problems | Yes | More than 36 user-selected reports | Yes | No | Yes | No | No | No | $19,500-$24,500 |
| | Response Time Analyzer for IMS | MVS SP/1, SP/2 | IMS response time for selected work loads can be monitored by time of day, time interval on on an exception basis | IBM CPU capable of running IMS | Time slot, time interval, moving slot and work load (transaction group) analysis | Yes | NA | Yes | Yes | No | No | No | No | $9,500-$10,500 |
| | Response Time Analyzer for CICS | MVS SP/1, SP/2, DOS/VSE SP | Selected work loads can be monitored by time of day, time interval on on an exception basis | IBM CPUs capable of running CICS | Time slot, time interval, moving slot and work load (transaction group) analysis | Yes | NA | Yes | Yes | No | No | No | No | $1,800-$10,500 |
| | ESRA/CICS | MVS SP/1, SP/2 (XA) | CICS | IBM CPU capable of running CICS | Intelligent performance monitor identifies CICS performance problems and analyzes the causes | Yes | Automatically customized reports to match performance problems | Yes | No | No | No | No | No | $13,500-$14,500 |
| | Omegamon for MVS | MVS SP/1, SP/2 | TSO, batch jobs, started tasks and hardware configuration | IBM CPU and compatibles capable of running MVS | Warns of hardware and software conditions threatening availability on resource levels, gives a real-time window into MVS, provides authorized users a set of action commands for correcting problems | No | NA | Yes | Yes | No | No | No | No | $23,500-$28,500 |
| | Omegamon for CICS | MVS SP/1, SP/2 | CICS | IBM CPU and compatibles capable of running MVS | Exception, bottleneck and impact analysis, exploratory and action commands | No | NA | Yes | Yes | No | No | No | No | $23,500-$25,500 |
| | Omegamon for IMS | MVS SP/1, SP/2 | IMS | IBM CPU and compatibles capable of running MVS | Warns about hardware and software conditions threatening IMS service, provides a real-time window for observing factors affecting IMS service, gives authorized users a set of action commands for correcting problems | No | NA | Yes | Yes | No | No | No | No | $19,500-$24,500 |
| | Omegamon for VM | VM/SP, VM/HPO, VM/XA | VM/SP, VM/HPO, VM/XA | IBM CPU and compatibles capable of running VM | Warns about hardware and software conditions threatening service to VM on its guest operating systems, provides a real-time window for observing factors affecting service, provides authorized users a set of action commands for correcting problems | No | NA | Yes | Yes | No | No | No | No | $7,500-$17,500 |
| Carolian Systems International, Inc. (416) 673-0400 | Sysview | MPE | Resource usage (CPU, disk, memory) | HP 3000 | Global and process level information, response time figures by process, reporting of abnormal situations, freezes time to view all aspects of the system, interactive batch and logging options | Yes | Text reports based on user-defined parameters | No | Yes | Yes | Sysplan | No | Any ASCII files | $4,000 |
| | Sysplan | MPE | Resource usage (CPU, disk, memory, printers, tape) | HP 3000 | Accurate global and process-level data collection, user control in reporting, flexible reporting, low overhead during data collection, trend graphs for planning future hardware configurations | Yes | Numerical, graphics | Yes | Yes | Yes | NA | No | Any ASCII files | $8,000 |

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chicago Soft Ltd. (312) 525-6400 | The Boundary Alert System | MVS, MVS/XA | SNA networks | IBM 4300, 3080, 3090 | Measures availability and outages of network resources, shows chronic error conditions that are self-recovering | Yes | Management, exception | Yes | Yes | Yes | Yes | No | MICS, MXG, IBM network logs | $9,500 |
| | Pool Monitoring Facility | MVS, MVS/XA | Static capacity utilization of DASD devices | IBM 4300, 3080, 3090 | Monitors amount of space allocated on each group of volumes designated in storage pools, sends messages to a TSO user if user-specified threshold is exceeded | Yes | Pool utilization reports, capacity planning reports | Yes | Yes | Yes | Yes | No | MICS, MXG | $6,200 |
| Computer Associates, Inc. (219) 232-7921 | Mandamon | MVS | Networks | IBM mainframe | Processes data and generates reports, on-line reporting | Yes | More than 200 reports | Yes | Yes | Yes | No | No | No | Contact vendor |
| Corporate Computer Systems, Inc. (201) 946-3800 | Transparent Activity Sampling Program | RTE A, VI | Computer resource usage | HP 1000 RTE A, VI | Monitors resource usage, detects program and system bottlenecks, improves individual program or overall system efficiency, evaluates current and future system capacities | Yes | — | No | Yes | No | No | No | No | Contact vendor |
| Daniel Computing Systems, Inc. (403) 273-2657 | The Benchmark Monitor for RSX | RSX-11M/ Mplus | OS, applications programs | DEC PDP-11 | Disk tuning, I/O breakdowns | No | NA | No | Yes | No | On-line reports | No | No | $2,000 |
| Database Utility Group Inc. (206) 878-1001 | APAS/Insight (Adabas Performance Analysis System) | MVS, MVS/XA, VS 1, DOS/VSE, DOS/SP, VM/CMS, BS 2000 | Work done by Adabas | IBM 3070 and compatibles | Generates detail, summary information on copy reports or data files directly from Adabas or files of command log records, selective logging of command data, performance history system, flexible request system | Yes | Summary (command type, user ID, etc.), descending sort sequence, graph formats, on-line snapshots of Adabas nucleus performance levels | Yes | Yes | Yes | Included in history system | No | Any other reporting or analysis software | $15,000 (with Insight) |
| | Spacemon | MVS, MVS/XA, VS 1 | Adabas physical I/O | IBM 3070 and compatibles | Samples Adabas physical I/O, attributes I/O to detailed data base components, analyzes I/O usage to calculate optimum data base organization, analyzes each data base file to identify inherent performance problems | Yes | Static, summary and detail reports | Yes | Yes | Yes | Spacemon directory and history file | No | No | $9,750 |
| Datacomm Management Sciences, Inc. (203) 838-7183 | NSM-64 | PC-DOS | Network performance utilization and availability | IBM PC AT and compatibles, line-access module required (proprietary) | Real-time problem identification and isolation, cost allocation, network optimization and planning, management of service-level agreements | Yes | Group performance, line analysis, control unit, device transaction-level and real-time alarm reports | Yes | Yes | Yes | Utilization, trend analysis reports | No | Any PC-DOS based software (Dbase III, 1-2-3) | $3,500 (software), $1,000 (module) |
| | NSM-1000 | RSX | Network control, management and planning | DEC PDP 11-73, line access module required (proprietary) | Real-time problem identification and isolation, cost allocation, network optimization and planning, management of service-level agreements | Yes | Network control, management and planning reports | Yes | Yes | Yes | Utilization, response time distribution and application utilization reports | No | No | $15,000 (software), $1,000 (module) |
| Datamax Computer Systems, Inc. (805) 948-8637 | Virgo | MPX | Disk I/O, system service calls, CPU usage, general I/O | Gould computers (except Concept machines) | System integration, troubleshooting, space capacity measurement, task performance analysis | Yes | Time-based graphs, detail event, disk usage histograms, file reference summaries, general performance summaries | Yes | No | Yes | No | No | No | $7,500-$8,500 per CPU depending on version |
| Datametrics Systems Corp. (703) 425-1006 | Torch/PMS | OS-1100 | Master log file, Mapper log, I/O trace | Unisys 1100/60, 1100/70, 1100/80, 1100/90 | Measures system utilization, analyzes performance problems, work load trend analysis, capacity planning, justifies upgrades | Yes | Work load profiles, I/O reports, critical factors, management summaries, scatter plots | Yes | Yes | Yes | Produces inputs to computer modeling packages, allows user to define generalized work load classes | No | Capacity/C (proprietary), MVAP, Best/1 | $7,470-$14,940 (per module) |
| Davis, Thomas & Associates, Inc. (800) 521-6773 | DTA/LMON | DOS/VSE | Organizes shared virtual area | IBM 4300, 9370 | Decreases size of SVA, reduces I/O, reduces CPU time required to load phases, shortens batch runtimes, makes recommendations to improve performance | Yes | Analysis of phases loaded, analysis of existing SDL/SVA, overview of existing SDL/SVA, DTA/LMON recommendations report | No | No | No | No | No | No | $1,200 |
| DBMS, Inc. (312) 961-5700 | Realtime Performance Monitor | OS | IDMS systems monitor | IBM mainframe | Determines bottlenecks within IDMS systems, performs wait-time analysis | No | NA | No | Yes | NA | No | No | No | $29,900 |
| Digilog (215) 628-4630 | Digilog Protocol Analyzer Family | Proprietary | SDLC/SNA, HDLC/X.25, 3270 bisynchronous | Digilog protocol analyzer (required to run the system) | Measures line utilization, response time, frame-level statistics, average message and packet length, protocol efficiency | No | NA | Yes | Yes | Yes | Statistical and performance information presented | No | No | $300 (per protocol), $1,400-$22,000 (for analyzers) |
| Digital Equipment Corp. (617) 897-5111 | VAX PCA | VMS | How well an application is running | DEC VAX | Evaluates performance of applications execution | Yes | Histograms, tables, lists | Yes | No | Yes | NA | NA | Proprietary | $1,050-$25,200 (depending on hardware) |
| | VAX SPM | VMS | System resource utilization | DEC VAX (except Microvax 1) | System tuning, capacity planning | Yes | Video displays, tabular reports, printed graphs, resource statistics reports | Yes | Yes | Yes | Through utilization analysis, trends | No | Proprietary | $900-$18,000 (depending on hardware) |

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Duquesne Systems, Inc. (412) 323-2000 | Netspy | MVS, MVS/XA | Network performance | IBM mainframe and compatibles | Reports on end-to-end user response time | Yes | Graphics, management, detail | Yes | Yes | Yes | Provides information for network capacity planners | No | MICS | $15,000 |
| | DASDMON | MVS, MVS/XA | DASD performance | IBM mainframe and compatibles | Monitors performance of DASD I/O subsystem | Yes | SAS, graphics, management, detail | Yes | Yes | Yes | No | Yes | No | $15,000 |
| | QCM | MVS, MVS/XA | MVS mainframes | IBM mainframe and compatibles | Total CPU and I/O measurements | Yes | SAS, graphics, management, detail | Yes | Yes | Yes | Creates information necessary for capacity planners on mainframes | No | No | Starts at $14,000 |
| | Program Management Optimizer | MVS, MVS/XA | Partitioned data set directory activity | IBM mainframe and compatibles | Monitors and eliminates DASD I/O to partitioned data set directories (PDS directory I/O) | Yes | On-line, batch, detail activity | No | Yes | No | No | No | No | Starts at $7,500 |
| | Quickfetch | MVS, MVS/XA | Program fetch activity | IBM mainframe and compatibles | Monitors and eliminates program fetch I/O | Yes | On-line, batch, detail activity | No | Yes | No | No | No | No | $14,000 |
| EEC Systems, Inc. (617) 443-5106 | Turbodisk | VMS | I/O performance | DEC VAX | Analyzes file system and determines which files are most heavily used, off-loads heaviest I/O activity to main memory | Yes | I/O activity | No | Yes | NA | No | No | No | $1,250-$10,000 (depending on version) |
| | Turbodisk Plus | VMS | I/O performance | DEC Microvax II, QED1 (RAM required) | Analyzes file system and determines which files are most heavily used, off-loads heaviest I/O activity to main memory | Yes | I/O activity | No | Yes | NA | No | No | No | $2,500 |
| Gejac, Inc. (301) 725-2000 | SRF Software Performance Monitor | RSX-11, M-Plus | System tasks and user activities | DEC PDP-11 | Monitors system capacity, pinpoints I/O problems, analyzes task performance, identifies pool fragmentation and problems, eliminates device bottlenecks | Yes | Graphics, summary, detailed statistical and trend reports | Yes | Yes | Yes | Yes | No | SAS, Data-trieve | $4,000-$5,000 |
| | AESAP | VMS | Operating system, peripherals, users, projects, programs | DEC VAX, Vaxcluster, Microvax | Capacity management, trend analysis, performance evaluation, tuning and monitoring programs, resource management | Yes | On-line color graphics, data base historical reports, trend analysis, summary | Yes | Yes | Yes | On-line graphics, detail technology performance monitoring, summary reports | No | Data-trieve, Fortran, Cobol | $5,000-$13,000 |
| Goal Systems International, Inc. (800) 848-4640 | Explore/CICS | VSE, VSE/SP, CICS | CICS system activity for performance monitoring | IBM 370, 4300, 3080,3090 | CICS system status, threshold monitoring, degradation analysis, on-line reports and flashback facilities, batch interface | Yes | Histograms on long-term trends, tabular reports, plots and graphs in histogram format | Yes | Yes | Yes | No | No | Proprietary | Contact vendor |
| | Explore/VM | VM/SP, HPO | System activity, virtual machines | — | Exception monitoring and handling, automatic facility, virtual machine degradation and real device analysis | No | NA | Yes | Yes | Yes | No | No | NA | Contact vendor |
| | Explore/VSE | VSE/SP, DOS/VSE | System activity | IBM 370, 4300, 3080, 3090 | Wait-state monitor, job execution monitor, loop detection, automatic command execution, system analysis | No | NA | Yes | Yes | Yes | No | No | Proprietary | Contact vendor |
| Honeywell Bull, Inc. (617) [illegible] | Basic System Indicator | GCOS 7 | Work load and resources of GCOS 7 installation | DPS 7, DPS 7000 installations | Analysis of system configuration, CPU and I/O activity, virtual memory manager, memory usage, transaction processing and interactive time-sharing applications response times, disk subsystem | Yes | Graphs, histograms, tabulations, statistics varied by parameter | Yes | Yes | Yes | No | — | Proprietary | Contact vendor |
| | System Behavior Reporter | GCOS 7 | Work load and usage of GCOS installation; user can choose analysis on all measurable aspects of system activity | DPS 7, DPS 7000 installations | Analysis of CPU and I/O activity, virtual memory manager load and usage, response time for all communications jobs, real-time activity, existing segment and page processing, software configuration tables | Yes | CPU activity per processor, service time per system process, activity of specific disk including service time, queue length and seek length | Yes | Yes | Yes | Yes | — | — | Contact vendor |
| | Statistical Instrumentation Facility 8 | GCOS 8 | Total systems | GCOS hardware platforms | Performance data manager, GCOS 8 service that provides various instrumentation points, allows user to write monitors and capacity planners without knowledge of internal table structures | No | NA | No | No | No | No | No | Proprietary | Contact vendor |
| | Transaction Processing Monitor | GCOS 8 | Transaction processing production | VIP series terminals, IBM PC and compatibles, Macintosh, terminal emulation software | Definition, on-line transaction statistics | No | NA | No | Yes | Yes | No | No | No | Contact vendor |
| | System Trace and Event Monitor | GCOS 8 | Disk I/O performance | GCOS 8 hardware platforms | Customizable spooling and utilization analysis, I/O categorization | Yes | Summary and detail reports of previous functions | No | No | No | Yes | No | No | Contact vendor |
| | Personal Support Environment 8 | GCOS 6, GCOS 8 software | | VIP series terminals, IBM PC and compatibles, Macintosh, terminal emulation software | Interactive monitors for displaying system tuning parameters | No | NA | No | Yes | No | Dispatchers, queue changer | No | No | Contact vendor |

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Honeywell Bull, Inc. (617) 895-6000 | Performance Utilization System Monitor | GCOS 6 | Total system | VIP series terminals, IBM PC and compatibles, Macintosh, terminal emulation software | Real-time analysis, graphics, color, threshold analysis, menu-driven | No | NA | Yes | Yes | No | No | No | No | Contact vendor |
| | Performance Analysis Reporting System 6 | GCOS 6 | Total system | GCOS 6 hardware platform | Trending, data archiving and retrieval, threshold and work group system analysis | Yes | System, trending, summary, exception reports | Yes | No | Yes | No | No | Proprietary | Contact vendor |
| | DPS 6 System Monitor | GCOS 6, MOD 400 | CPU utilization, effectiveness of disk caching | DPS 6 models | Monitors CPU utilization, CPU/disk overlap, operating system ring usage, priority level usage, I/O ratio, number of I/Os, I/O length, correctable I/O errors, simulates disk caching, provides projected performance data | Yes | Summary and detail system utilization, detail disk utilization, detail CPU utilization | No | Yes | Yes | No | — | No | Contact vendor |
| | Cache Statistics Display | HVS 6 | Effectiveness of disk caching | DPS 6 Plus models | Calculates and displays read-to-hit ratio, read-to-I/O ratio, total I/O requests, average I/O lengths, I/O sustained for data cached in both sequential and random mode, calculates number of file system requests, page requests and physical I/O requests | No | NA | No | Yes | Yes | No | — | No | Contact vendor |
| | Video | GCOS 6, MOD 400 | System resource usage | DPS 6, DPS 6 Plus models | Displays user resource statistics, device status, memory usage | Yes | Communications, channel statistics, summary and status statistics report | No | Yes | Yes | No | — | No | Contact vendor |
| | Communications Status and Statistics Utilities | GCOS 6, MOD 400 | Communications subsystem | DPS 6, DPS 6 Plus models | Displays number of I/O requests for all or some channels, number of processor interrupts, usage of communications subsystem elements | Yes | Communications statistics summary, channel statistics summary, station statistics | No | Yes | Yes | No | — | No | Contact vendor |
| Help/38 Systems, Inc. (612) 933-0609 | Auto Tune | CPF | Amount of memory given to a task, jobs allowed to run in a given amount of memory | IBM System/38 | Monitors activity on system every 10 seconds, adjusts memory pool size and activity level | Yes | System activity reports | No | Yes | Yes | No | No | No | $1,750 |
| Independent Computer Systems (602) 966-2600 | Toolbox | MOD 400, GCOS 6, HVS | System resources | DPS 6 (all models) | Disk queue information, critical resources monitoring, buffer pool statistics | No | NA | No | Yes | Yes | No | No | No | $4,400 (for the module) |
| IBM Contact local IBM sales office | CICSPAR/MVS | CICS, OS, VS | CICS, OS, VS | — | On-line performance monitoring capabilities, alert monitor, problem determination facilities, tutorial Help function | Yes | Analysis of CICS/OS/VS resource use and task activity, batch reporting | Yes | Yes | No | Exception summary and storage history reports | No | — | Contact vendor |
| Innovative Software, Inc. (800) GET-SMART | The Smart LAN Performance Test | MS-DOS, PC-DOS | PC LAN, Netbios operating systems | IBM PC and compatibles | Allows user to compare performance of LAN systems in standard working environment | Yes | Network configuration comparisons | Yes | No | Yes | No | No | No | $49.95 (for software) |
| Interactive Solutions, Inc. (201) 488-3708 | Acacia/OPM | MS-DOS, PC-DOS | End-user response time | IBM PC, XT, AT and Irma board, IBM 3274 controller | Measures end-user response time in IBM mainframe environment by transaction types and groups | Yes | Response-time distribution by transaction, percent of total transaction, average response time in seconds, distribution reports | No | Yes | Yes | Yes | Yes | SAS, 1-2-3, others | $1,995 and up |
| Jones Data Services, Inc. (714) 770-7700 | Canopus | DOS/VSE, DOS/SP/2 | Operating activities, console management | Mainframe running DOS/VSE, DOS/VSE-SP2 | Processor capabilities, data and data storage activity, reports more than 140 programmable functions | No | NA | No | Yes | Yes | — | No | Most | $9,900 |
| Kiaco Information Systems (914) 241-7233 | F1 Manager | SSP | Disk performance | IBM System/36 | Disk space maps, disk allocations by department, managed disk backups | No | NA | No | No | Yes | Yes | No | No | $250 |
| Landmark Systems Corp. (800) 257-0011 | The Monitor for CICS | VSE/MVS | CICS | IBM mainframe | Application tuning and debugging, performance monitoring, response times, transaction statistics, data management and batch reporting, file activity monitoring | Yes | Transaction and file performance summary, user summary by account, customized reports | Yes | Yes | Yes | Yes | — | DL/I, Adabas, I-dms, Mantis, MICS, Millisecond | $8,000 (VSE), $21,000 (MVS) |
| MacKinney Systems (417) 882-8012 | Peek CSA | All versions of IBM DOS/VSE, OS | CICS | IBM CPU and compatibles running DOS/VSE, VSE 2.1 | File and local shared-resource statistics, CICS storage utilization statistics, CSA/TCT statistics, core display and modification, general system statistics | No | — | No | Yes | No | No | — | No | $695 |
| Micro Focus, Inc. (800) 223-8414 | VMAC | VM (including SPO and XA) | Operating system | IBM 370, 3000, 3090, 4300, VM compatibles | DASD connection and mark analysis, dynamic bottlenecks, user resource control, user job analysis tool | Yes | Performance statistics vs. time, user-specified reports based on data dictionary | Yes | Yes | Yes | Yes | No | Yes | Contact vendor |
| | System Accounting | DOS/VSE | DOS/VSE, CICS (optional) | IBM 370, DOS/VSE and compatibles | DASD connection and mark analysis, dynamic bottlenecks, supports IBM Power accounting, user job analysis tool | Yes | Performance statistics vs. time, user-specified reports based on data dictionary | Yes | Yes | Yes | Yes | No | Yes | Contact vendor |
| Mansoglio and Associates, Inc. (517) 332-4700 | IBM System/38 Communication Line Monitor | NA | Communication lines connected to System/38 | None | Responds to line failures, restarts device, logs status of lines, controllers and devices | Yes | Problem-specific, status and corrective action | Yes | No | No | No | No | Systems/38 CSNAP | $295 (for one-time license fee) |

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| McCabe & Associates, Inc. (800) 638-6316 | Analysis of Complexity Tool | VMS, Unix, MS-DOS | Complexity of application code | DEC VAX, IBM PC and compatibles | Complexity metrics, module test paths with test conditions, design structure and references | Yes | Flow charts, annotated source and test path listings, design structure | Yes | No | Yes | No | Yes | Yes | Contact vendor |
| M. L. Ellis & Associates, Inc. (512) 343-4517 | OTAM-1100 | Series 100 Executive System | Operating system | Unisys 1100 | Allows system tuning for better efficiency, monitors performance and effects of new applications, allows monitoring of data base work loads, takes user-specified alert action when user thresholds are exceeded | Yes | System statistics vs. time | Yes | Yes | Yes | No | No | No | Contact vendor |
| Morino Associates, Inc. (703) 734-8494 | TSO/MON | MVS, MVS/XA | Use and performance of TSO, including TSO sessions under ISPF/PDF | IBM 370, 4300, 3080, 3090 and compatibles | Measures response time for TSO systems and consumption of resources by system, user, program, command and CLists; maintains historical file of TSO usage/performance; provides analysis of user and performance of data base applications and fourth-generation languages | No | Detail tracking, audit, management summary, color graphics | Yes | Yes | Yes | Yes | No | T/M on-line, MICS TSO component | $26,000 (initial-year license fee) |
| | MICS Capacity Planning Component | MVS, MVS/XA | Work load size and resources, consumption, estimates future demand in an MVS or MVS/XA environment | IBM 370, 4300, 3080, 3090 and compatibles | Integrated methodology and tools needed to implement effective capacity planning programs, work load characterization and forecasting, reporting | Yes | Work load characterization, work load forecasting, presentation graphics, Gantt chart forecasting | Yes | No | Yes | Yes | No | With each MICS component, uses MICS data base files as input | $8,000 (initial-year license fee |
| | MICS Performance Management Component | MVS, MVS/XA | System performance, changes in performance over time | IBM 370, 4300, 3080, 3090 and compatibles | Batch work load analysis, MVS systems tuning, I/O configuration analysis, monitors and tracks existing performance and changes in performance over time. | Yes | Work load characterization, IPS analysis, real storage analysis, auxiliary storage analysis, I/O analysis including shared DASD | Yes | No | Yes | Yes | No | With each MICS component, uses MICS data base files as input | $8,000 (initial year license fee) |
| NCR Comten (612) 638-7944 | Comten Communication Alerting Facility | COS (proprietary) | Provides real-time status and configuration information on communications lines terminated by NCR Comten communication processors | NCR Comten communications processor, Comten T-4050 or T-4017 | Provides real-time status and configuration information for all communications lines attached to NCR Comten communications processor; alerts users when monitored communications line does not meet performance thresholds and parameters | No | NA | No | Yes | No | No | No | No | $902-$2,706 annual license fee |
| | Comten Overview | MS-DOS, PC-DOS | Monitors incoming information such as trunk and X.25 statistics and system performance from NCR Comten communications processors | PC-based Comten T-4062 console or specific configurations of compatible PCs, NCR Comten communications processor | Monitors incoming information, allows users to build and store command lists, initiates predefined command lists in response to a user-defined event, notifies operators of critical network problems, assists operators through menu-driven command mode | Yes | Dependent on external report generator | Yes | Yes | Yes | Output files can be used with external capacity-planning aids | Yes | Any ASCII files | $2,200 annual license fee |
| Northwest Digital Software, Inc. (800) 547-0521 | IPM RSTS Performance Monitor | RSTS | RSTS operating system | DEC PDP-11 | Uses AI algorithms to suggest performance enhancements, identifies performance bottlenecks on system, application and file level | Yes | User-defined, plots, histograms, calculations | Yes | Yes | Yes | English-language summary of resource availability | Yes | No | $1,750 (one-year license fee) |
| Operations Control Systems, Inc. (415) 493-4122 | OCS Scheduler, Dispatcher, Network, Librarian | MPE (all versions) | Production software task activity | HP 3000 series | Detects bottlenecks, schedules production, work load balancing | Yes | User-specified reports, command set, performance statistics vs. time, logs production activity | No | Yes | Yes | Protects production work loads | No | Most HP application software | $2,500-$15,000 |
| Pure Research, Inc. (617) 268-3438 | Time Tracker | IBM SSP | CPU time/job, device utilization | IBM System/36 | Achieves maximum response time, allows tuning of task scheduling, records usage and cost by department/workstation | Yes | CPU time graphs and reports, cost/device utilization vs. time reports for departments and workstations | Yes | Yes | Yes | Yes | No | No | $750 |
| Peregrine Systems, Inc. (714) 855-3923 | PNMS III | MVS, Unix | All data center operations | IBM 3070, 3080, 3090, 4300 series and compatibles | Problem tracking, change management, inventory control and management, financial management | Yes | Availability and budget forecast reports | No | Yes | No | Problem management reports, resource evaluations, budget forecasts | Yes | — | Contact vendor |
| Performance Systems, Inc. (301) 793-6000 | SCERT II | MVS, VM | Overall system performance | IBM mainframe, IBM PC AT and compatibles | Modeling capability, predicts performance | No | NA | Yes | Yes | yes | Within program functions what-if modeling | Yes | IMF, SMF, MRG, SAS | $60,000 |
| Programart (617) 661-3020 | Strobe | MVS | On-line and batch applications | IBM mainframe and plug compatibles | Reports on transaction usage by control section, DASD usage by cylinder, program usage by procedure, CPU and I/O usage | Yes | NA | Yes | Yes | Yes | No | No | Computer Associates Optimizer/Indexer | $35,000-$50,000 |
| Rimco Rabbit Software, Inc. (201) 263-0600 | Rabbit 2 | VAX/VMS | Monitors resources and activity | DEC VAX running VMS | Provides graphics analysis of VMS resource consumption, security analysis and monitoring, resource analysis by accounts | Yes | Graphics reports | Yes | Yes | No | Based on performance analysis | NA | No | $600-$12,000 |
| Rimsco Software, Inc. (713) 946-0724 | Facilities Administration Assistance Package | VOS | All hardware and software usage | Any Harris H series H100-H1500 | Storage distribution, security, resource usage | Yes | Storage distribution, resource utilization, operating system activity | Yes | Yes | Yes | Storage distribution by user | NA | No | $4,600 |

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scientific Business Systems, Inc. (212) 481-1310 | Vomad | DOS/VSE | VSAM | Any IBM mainframe running DOS/VSE | Monitoring and tuning VSAM clusters | No | NA | No | Yes | No | No | No | No | $2,000 |
| Sinware, Inc. (613) 727-1779 | SIM/Config | MS-DOS, PC-DOS | Hardware device inventory, connectivity | Hardware with graphics card and color monitor | Hardware configuration and connectivity management | Yes | Configuration diagrams, circuit, cable, DASD hardware device reports | No | No | Yes | Allows illustrative analysis of future configurations | NA | Info/Management | $5,000 with site license |
| Softlight Corp. (803) 833-6127 | Performance Analyst | SSP | Enhancement to system measurement facility | IBM System/36 | Graphing and reporting SMF data | Yes | Summary and exception reports | Yes | No | Yes | History reporting | NA | IBM Query 36 and PC Support 36 | $199 |
| Software Clearing House, Inc. (513) 451-6742 | SAT | NCR VRX | System performance | NCR 8400, 8500, 8600, 8800, 9800 | Job scheduling, predicts future hardware requirements, tracks overall operations, auditing, chargebacks and rate determinations | Yes | Audit and job statistics reports, device utilization, CPU job priority analysis, unsuccessful job determination | No | Yes | No | Idle time and activity analysis, usage graphs, monthly summary of trends | Yes | NA | Contact vendor |
| Software Diversified Services (a division of J. W. Lampi, Inc.) (612) 571-9000 | Orca | DOS/VSE, VSE/SP | CICS, DOS/DL/I | IBM 4300 series, any IBM or plug compatible running DOS | Information on operation of CICS system | Yes | Historical data reports | No | No | No | No | No | No | $2,600 |
| Software Extraordinaire, Inc. (206) 282-9422 | The Performance Analyzer | Wang VS | Wang systems, CPU utilization, disk I/O, memory utilization | Any Wang CPU running VS | Provides data for disk use optimization and tuning | No | NA | Yes | No | Yes | Main memory and disk utilization, actual usage vs. theoretical capacity | No | No | $2,500 |
| Software Techniques, Inc. (714) 895-1633 | ACT/Project | VAX/VMS | Usage accounting | Any DEC VAX | Centralized data bases shared across a network, add and delete functions, user-definable chargeback codes | Yes | User, account, division | No | Yes | No | Yes | NA | RMS and compat-files | Contact vendor |
| Star, Inc. (800) 258-STAR | VSUM | MVS | VSAM | IBM mainframe | Performance and design tool; list, model and design functions; analyzes recommendations | Yes | All catalog, tuning and design information, space utilization | Yes | Yes | Yes | Analysis, ability to interrogate VSAM files | Yes | No | $4,200 single CPU |
| Sterling Software Marketing (a division of Sterling Software, Inc.) (916) 635-5535 | Smart DASD | OS | DASD performance | IBM mainframe and plug compatibles | Contention analysis tool; monitors I/O activity, suggests data set placements, minimizes contention between volumes at string level, simulates environment before migration | Yes | Degradation and DASD subsystem analysis, DASD string contention, DASD space utilization | No | No | No | Through reporting functions | Yes | IBM GDDM, SAS | $10,000 per site |
| Tandem Computers, Inc. (408) 725-6000 | Measure | Guardian 90 (proprietary) | System performance | Any Tandem Nonstop VLX, TXP II, EXT-10, EXT-25, CLX systems | Allows continuous measurement, examines data, coordinates measurement functions, user and programmatic interfaces provided, no software program changes required | Yes | Status on all current measurements and counter records for entity types in one measurement, bar graphs comparing counter value for entity type, information on configuration being used for any given measurement | Yes | Yes | No | Yes | No | Proprietary | $1,500-$3,000 (initial license fee) $100-$200 (monthly license fee) |
| Technitronics, Inc. (703) 749-1471 | Explicit | MVS-resident | Monitors VM on MVS mainframes, SNA networks | IBM mainframe or plug compatible, analytical/graphics on IBM PC AT, XT or PS/2 | Performance management through interactive graphics; performance analyzer | Yes | Tabular, histogram, scatter diagrams | Yes | Yes | Yes | PC-based analytical models | NA | SAS | $5,000-$40,000 |
| Telebyte Technology, Inc. (516) 423-3232 | Netscope | NA | Data communications on RS-232 networks | RS-232 port | Monitors, emulates and tests RS-232 circuit | No | NA | Yes | Yes | No | Troubleshooting ability | No | NA | $1,800 |
| Telwatch (916) 355-8550 | Netwatch | Unix, MS-DOS | Network voice and data circuits | NA | Checks for noise, poor transition level, out-of-service trunks | Yes | Traffic summaries, call duration, transmission parameters, peg count, bad-call percentage | No | Yes | Yes | Traffic summaries, group traffic and group-traffic-by-hour reports | No | Proprietary, IBM Netview | $1,000-$3,300 (depending on configuration) |
| | T1 Watch | Unix, MS-DOS | T1 circuits | NA | Monitors DS1 signal, DS0 trunks | Yes | Traffic, data traffic by hour, average call duration and level, noise and return loss per trunk | No | Yes | Yes | Traffic summaries, group traffic and group-traffic-by-hour reports | No | Proprietary | Contact vendor |
| | Datawatch | Unix, MS-DOS | Full duplex dial-up data circuits | NA | Identifies signaling and traffic problems and circuits with low receive level | Yes | Detailed traffic | No | Yes | Yes | Traffic reports, eliminating over or under trunking | No | Proprietary | Contact vendor |
| | Net Exec | Unix, MS-DOS | Telecommunications networks | NA | Gathers, stores and manipulates information collected from multiple Netwatches | Yes | Consolidated management, customized, exceptions | No | No | Yes | Trunk traffic report | No | Proprietary | $3,000 |
| | Net Exec 2000 | Unix | Telecommunications networks | Unix processors | Monitors transmission equipment and circuits for failures; centralized collection of failure information, analyzes cause of network trouble, generates temporary work-around, tracks from problem identification to resolution | Yes | List of alarms, trouble ticket reports | No | Yes | yes | No | No | Proprietary | Contact vendor |

| COMPANY | PRODUCTS | OPERATING SYSTEM | ENVIRONMENT MEASURED | HARDWARE REQUIRED | MAJOR FUNCTIONS | INCLUDES REPORT GENERATOR | TYPES OF REPORTS PRODUCED | GRAPHICS ANALYSIS OF DATA | ON-LINE, REAL-TIME REPORTING | DATA ARCHIVING | CAPACITY PLANNING AIDS | MODELING FEATURES INCLUDED | INTERFACES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Telesteth (916) 355-8550 | Net Optimizer | MS-DOS | Telecommunications networks | IBM PC and compatibles | Network design and engineering tool; collects, analyzes and reduces traffic data for engineering calculations; supports engineering of long-distance services by trunking, costing and optimizing the network to meet grade-of-service requirements | Yes | Prints all streams, traffic summary and engineering reports | No | No | Yes | Yes | Yes | Telesteth Call Accounting Software | Contact vendor |
| Unisys Corp. (215) 542-4187 | Performance Display System | OS-1100 | Operating system | PC connected to mainframes | Collects, organizes and displays information collected by five system logs; includes communications activity | No | NA | Yes | Yes | Yes | No | No | SIP, I/O Trace, System Log, Mapper Log, Telcon Log | Contact vendor |
| VM/CMS Unlimited, Inc. (617) 268-4434 | CMS Command Monitor/ Analysis Package | VM/SP, VM/HPO | CMS command use | Any IVM or plug compatible running VM | Performance and user-behavior analysis; provides management information on critical users, applications | Yes | Raw data, command and user summary, command and user detail | Yes | Via SAS interface | Yes | Analyze trends to prepare for growth | No | CMAP/ Potem (Information Builders) | Contact vendor |
| VM Software, Inc. (703) 264-8000 | VM Monitor | VM, VSE guests | Data on system, user and I/O subsystem performance | IBM mainframe and plug compatibles | On-line, real-time and automated monitoring; tuning; capacity planning; diagnostic and benchmark capabilities; analysis | Yes | User resource, device and CPU utilization statistics, DASD I/O and minidisk histogram usage | Yes | Yes | Yes | Yes | No | Proprietary | $9,000 (Group 10 and 20 machines), $13,500 (Group 30 and 40 machines) |
| Wang Laboratories, Inc. (617) 459-5000 | VSAM III | VS | VS system performance | NA | Monitors CPU, I/O and memory usage interactively, stores results later analysis; reduces stored data for report use; plays back reduced data on interactive screens | Yes | Memory status, tape statistics, disk utilization, systemwide composite | No | Yes | Yes | No | NA | NA | Contact vendor |


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# Computerworld First with the news that's important to you.

**Computerworld:**

1-2-3 to go unprotected

BY DOUGLAS BARNEY

CAMBRIDGE, Mass. — Responding to years of continuous pressure from corporate software buyers and users groups, Lotus Development Corp. is preparing to remove all co

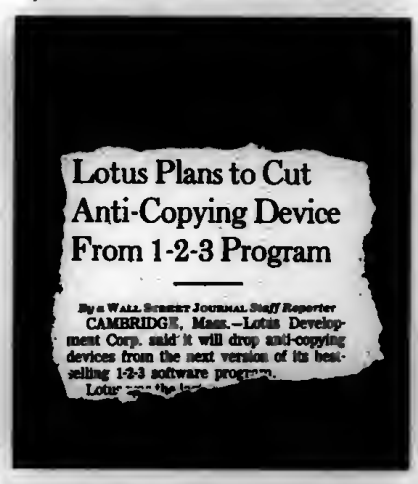
first-quarter 1988 release.

"There's a possibility we would release it before OS/2 if [the operating system's] availability gets blown out of the water," said Michael Kolowich, vice-president of corporate marketing and information services

*Continued on page 10*

**September 14, 1987**

**Wall Street Journal:**



Lotus Plans to Cut Anti-Copying Device From 1-2-3 Program

By a WALL STREET JOURNAL Staff Reporter

CAMBRIDGE, Mass.—Lotus Development Corp. said it will drop anti-copying devices from the next version of its best-selling 1-2-3 software program.

**September 16, 1987**

**PC Week:**

Lotus Will Remove Copy Protection From New 1-2-3

Competition, User Backlash Forces Lotus To Follow Suit

By Beth Freedman

CAMBRIDGE, Mass.—Succumbing to user demand, Lotus Development Corp. will drop copy protection from future

**September 22, 1987**

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# COMPUTER CAREERS

## Airline industry flying high

***Business skills, DP acumen present attractive package to travel firms***

BY PATRICIA TAYLOR
SPECIAL TO CW

Mergers, acquisitions and recent growth patterns within the travel industry are forcing the major airlines to either expand their MIS departments to meet the new demands or to begin looking to outside providers for support of their computing needs. Both scenarios bode well for experienced computer professionals.

For example, Northwest Airlines is currently looking to add MIS personnel, according to Lauren Dillard, director of MIS. Northwest is seeking talented professionals in the following four major applications development areas: maintenance and engineering, which includes flight crew management, scheduling and repair; on-line applications for reservations and weather information; finance, which handles accounting, passenger revenue and payroll; and management information systems, which includes support for the marketing department, frequent-flyer program, word processing and office automation.

Several other airlines are rethinking their internal commitments to the support of large MIS departments.

Continental Airlines and Eastern Airlines now support their information systems needs through a separate spin-off company with offices in Miami, Los Angeles and Houston. This division actively recruits at major colleges and universities for entry-level MIS positions.

These airlines are in need of well-rounded applicants who possess programming expertise and managerial skills. "After all, we are in the customer service business," one director of computer services says. "Our employees must have both technical and interpersonal skills."

Competition ranks high on the list as a driving force behind this growth and expansion. Each airline must compete on several fronts: scheduling, pricing, customer service, safety and marketing. The support system for each of these functions requires some facet of information systems.

Michelle Brown, staffing representative at Northwest, notes that since the merger of Northwest with Republic Airlines, both information systems departments need to expand and grow to meet the combined needs of the newly enlarged organization. "We must beat or match the competition's capabilities," she says.

As a result of the merger and an upcoming conversion from a Sperry Corp. to an IBM environment, positions ranging from entry level to management are available in all four information systems areas.

The most sought-after technical skills in the airline industry include knowledge of IBM assembler with demonstrated hands-on skill in writing code.

Airline Control Programming Language and Transaction Processing Function, a fast real-time programming environment specific to both the airline and banking industry, are also valuable skills.

A bachelor's degree in computer science with some business background will bring an entry-level employee at Eastern approximately $2,000 per month in salary plus benefits and a company-sponsored extensive training program to look forward to.

In general, the most attractive applicants will possess qualifications in two distinct areas — a business related area such as finance or marketing and data processing systems or computer science.

The requirements for MIS professionals working at the airline's corporate headquarters differ from those for professionals working within the central MIS organization, which is often a separate area supporting customer services rather than corporate functions.

> EACH AIRLINE must compete on several fronts: scheduling, pricing, customer service, safety and marketing. The support system for each of these functions requires some facet of information systems.

Once again, both technical and managerial skills are highly valued. However, previous experience is often considerd to be a must.

In general, corporate does not actively recruit for entry-level positions. Either employees are advanced from within or recruited for specific skills. Some of those skills include a working knowledge of fourth-generation languages, mainframe data base management and design and expertise in telecommunications.

These positions primarily support the internal business function, as opposed to customer service, which is in the realm of the central MIS function.

Those in the airline industry perceive themselves as being on the leading edge of technology as users of a broad and varied range of applications. Applications including market research, finance, customer incentives and scheduling are only a sampling of the types of programs necessary to support such a diverse environment.

Employment opportunities are limited geographically by either a professional's choice to work at an airline's corporate headquarters or work within the central MIS environment. Corporate headquarters for major U.S. airlines are located in a number of cities, including Minneapolis, St. Louis, Miami, Dallas and Kansas City, Mo.

In general, where an airline actively recruits entry-level positions, recruitment is normally confined to the surrounding geographical area to curtail the phenomena of "training and then draining," where the new employee moves closer to home once he or she has acquired marketable skills and experience.

Unique to the airline industry is the offer of free travel as a benefit of employment.

One note of caution in this industry: Turnover rates tend to be very low. With the aforementioned growth trends, however, positions continue to become available at an increasing rate.

*Taylor is an associate with the Center for the Study of Data Processing at Washington University in St. Louis.*


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Let us introduce you to the IDG Communications Computer Careers Network. It's the new advertising service that lets you run the most targeted and cost-efficient recruitment program possible.

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Customize your recruitment program. The Network's eight newspapers - *Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week*, and *Computer Currents*/Northern California, Southern California, and Boston editions - let you tailor your recruitment program to your specific needs. You can buy the basic package of three - or as many as eight with add-on options. That way you can recruit from the combination of computer and communications professionals that's best for you.

Target your ad placement. You can place your advertising exactly where you want. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Or you can extend your reach by running in two regions - or even nationally. Plus - you can still take advantage of stand-alone national rates for individual newspapers.

Reach qualified professionals cost efficiently. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network lets you buy the combination of newspapers that will deliver your recruitment message to qualified computer and communications professionals - and only those qualified professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you, or contact **John Corrigan**, Recruitment Advertising Sales Director, at 617-879-0700 ext 676.

One quick phone call can give you all the information you need on running your recruitment advertising in up to eight leading industry newspapers. And if you hurry, you can still get in on the special low introductory offer!

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Call your local sales representative today for more information about Computer Careers Network's regional, national and weekly reach.

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John Corrigan, Recruitment Advertising Sales Director, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 617-879-0700. **BOSTON:** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, Al DeMille, Regional Manager, Nancy Percival, Account Executive, 800-343-6474. (in Massachusetts, 617-879-0700). **NEW YORK:** Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, Warren Kolber, Regional Manager, 201-967-1350; Jay Novack, Account Executive 800-343-6474. **WASHINGTON, D.C.:** 3110 Fairview Park Drive, Ste 1040, Falls Church, VA 22042; Katie Kress, Regional Manager, 703-876-5100; Pauline Smith, Account Executive 800-343-6474. **CHICAGO:** 2600 South River Road, Ste. 304, DesPlaines, IL 60016; Patricia Powers, Regional Manager, 312-827-4433; Ellen Cross, Account Exective 800-343-6474. **LOS ANGELES:** 18004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-827-0164; Ellen Casey, Account Executive, 800-343-6474. **SAN FRANCISCO:** 18004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-827-0164; Chris Glenn, Account Executive, 800-343-6474.

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**BOSTON:** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, Al DeMille, Regional Manager, Nancy Percival, Account Executive; 800-343-6474. (in Massachusetts, 617-879-0700).

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NCR

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If you are sincere about a career move, it would be in your best interest to exclusively contact an agency that is well established, member of a national network, and will give your career interests top priority. *Please call Robert Montgomery collect at 919-787-4885 or send resumes to:*

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EEO M/F/H/V. Principals only

# SYSTEMS PROGRAMMING MANAGER

Stevens Institute of Technology, a leading institution of higher education, is seeking to identify a qualified Systems Programming Manager to coordinate all systems software development and support for VAXclusters, DECsystems, MicroVAX II's, campus wide Ethernet, local departmental networks, connections to several national networks and over 1500 microcomputers and workstations.

The Systems Programming Staff is responsible for supporting a variety of computing resources ranging from microcomputers through mainframes. Knowledge of operating systems, systems programming, higher level language programming, assembly language programming, state-of-the-art programming techniques, as well as the ability to supervise software design, development and maintenance. Experience supporting VAX systems under VMS, with DECnet and/or TCP/IP and related systems software is essential.

Responsibility of the Programming Manager will include supervising and coordinating the activities of the Systems Programming Staff, project and system management, analysis and design of new systems and network standards and software, evaluation and recommendation of software products and services, performance analysis and tuning, technical support, and interaction with network and operations support staff.

The position requires supervisory and design experience, good project leadership and communication skills as well as a Bachelors degree. Experience using DEC equipment is required. The Systems Programming Manager reports to Director of Computing and Communications Resources. If qualified, send your resume including salary history to: **Mr. James M. Nast, Director of Personnel Relations, Stevens Institute of Technology, Castle Point, Hoboken, New Jersey 07030.**

**Stevens Institute of Technology**

An Affirmative Action/Equal Opportunity Employer M/F

# SYSTEMS OPPORTUNITIES

**Northrop Electro-Mechanical Division in Anaheim, Southern California,** is searching for systems professionals. Design and implement improvements to an already highly sophisticated, integrated HP, IBM, DEC, and WANG environment with the company that recently earned a place in the bestseller *The 100 Best Companies To Work for In America*[1]. Write today.

### SYSTEM SPECIALIST

Your responsibilities will include maintaining program product software for our HP systems, performing and supporting image database administration, along with providing HP system capacity planning and performance measurement. You will also coordinate systems security, support disaster recovery, and contingency planning efforts. To qualify, you must be a self-starter with five to seven years of related experience; bachelor's degree in related field preferred.

### SR. SYSTEMS ANALYST

You will be expected to manage performance measurement, capacity planning and tuning on IBM, HP, DEC and WANG systems. In addition, you will coordinate and implement logical security systems and support program products. We're seeking an individual with a technical understanding of system performance and logical security concepts, data base management principles and one year of system enhancement experience. At least three years related experience and a bachelor's degree or equivalent in related field are necessary.

### INFORMATION RESOURCE PLANNING SPECIALIST

Act as a lead planner defining PMS-related user requirements, and propose and implement solutions to defined requirements based on cost and efficiency analysis. Tasks include performing feasibility studies, development of system architecture, preparation of systems and programming specifications. You will also provide technical support to the programming staff, perform code walk-through assuring codes are performing to standards set by the organization, and develop as well as conduct test scenarios. Develop instruction manuals and integrate system developed throughout the user organization. Excellent knowledge of the HP3000 operating system, PMS software, FORTRAN 77, proven interpersonal relations with users, and project management experience a must to qualify for the position. Bachelor's or Master's degree in related field preferred.

Also requires ten plus years experience in planning, designing, developing and/or implementing computer configuration manufacturing application.

### SENIOR COMPUTING ANALYST

Maintain current business applications running on HP3000. Enhance and modify systems as required. You will also act as project leader on assigned application projects.

Five plus years experience with MRP, material and related systems. Thorough knowledge of FORTRAN, COBOL, TDP and HP3000 systems. Bachelor's or Master's degree in related field preferred.

**For immediate consideration, please send your resume to: LINDSEY WILLARD, NORTHROP ELECTRO-MECHANICAL DIVISION, Personnel Administration, 500 E. Orangethorpe Ave., Dept CW998, Anaheim, CA 92801. Northrop** provides a comprehensive and competitive benefits package.

**MODEM USERS:** You can access a complete listing of career positions now available with your home computer and a modem. Dial **(213) 930-5539** and enter the password "Career Access" for 24-hour information. ***8N settings: data 8, stops 1, no parity, full duplex 300/1200/2400 baud.***

**U.S. CITIZENSHIP REQUIRED. Northrop is an Equal Opportunity Employer M/F/H/V.**

[1]Levering, Moskowitz and Katz. *The 100 Best Companies To Work For in America* ©1987 by New American Library, reprinted by arrangements with Addison-Wesley Pub Co Inc, Reading MA 01867

**NORTHROP**

**Electro-Mechanical Division**

Electronics Systems Group

### PROGRAMMER

Central Louisiana Electric Company, located in Pineville, LA, has an immediate opening for an individual with IBM 308X, MVS/XA, COBOL, CICS, ISPF and VSAM experience. College degree in Computer Science or related field and a minimum of 4-6 years experience. Please send resume with salary requirements to:

**Central Louisiana Electric Company**
**Attn: Employment Supervisor**
**P.O. Box 5000**
**Pineville, LA 71361-5000**

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Cherry Hill, NJ 08002 • (609) 667-4400

GCOS • IDMS • UNIX
Project Leader
ESTIMA INC
Computer Park, P.O. Box 2108
Hampton NH 03842 • (603) 926-7300

computer/net

### NCR VRX OPERATING SYSTEMS CONSULTANT

Computer Consulting Systems Inc. is seeking a systems analyst with 2 or more years experience with NCR VRX Operating System for several consulting projects. All responses will be treated confidentially. Contact:

**Norman R. Cohen**
**Computer Consulting Systems Inc.**
**1850 North Park Pl.**
**Bldg. 500**
**Atlanta, GA 30339.**
**(404) 956-5535**

# Applications and Systems Software Developers

Join an alliance of more than 1800 professionals who are developing business and systems software solutions for a wide variety of organizations. AGS is a public corporation (NYSE:AGS) with revenues of $400 million and 33 offices nationwide.

Our Database Development Group has immediate openings throughout the U.S. for individuals experienced in PL/1 or 'C.' A working knowledge of DB2/SQL, IMS or CICS is a big plus. Relocation is negotiable. Call or write to Steve Huvane, Technical Resources Manager,

**(212) 741-6200**

**AGS Information Services, Inc.**
**71 Fifth Avenue**
**New York, N.Y. 10003**

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**KENDA SYSTEMS, INC.**
BOSTON
NEW YORK
WASHINGTON

## SALES/RECRUITING PROFESSIONALS

KENDA SYSTEMS is a progressive software services organization providing engineering consultants on a contractual basis to the East Coast high tech community.

We are looking for talented, self-motivated sales/recruiting professionals and office managers seeking a dynamic growth environment to participate in our national expansion.

Forward resume to D. Sierra.

2 Manor Parkway
Salem, NH 03079
603/898-7884

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## UNIVERSITY OF MAINE SYSTEM

### SOFTWARE SPECIALIST

This new full-time regular position within Computing and Data Processing Services (CAPS) is based at the Orono campus but will provide centralized support for the seven campus University System. This individual will provide support for all data base management software supported by CAPS and for the application development activities which utilize that software. It will be the responsibility of the person to develop and enforce appropriate standards and procedures for the use and operation of these data base software products to ensure a stable responsive operating environment for applications based upon these products.

Specific responsibilities include: review of physical file designs, data base backup and recovery, performance monitoring, db reorganization, technical support for application programmers, planning the installation of new releases and product upgrades and data dictionary management.

Qualifications: Bachelor's Degree and a minimum of 5 years data processing experience on an IBM mainframe, experience in using a DBMS for system development and indepth knowledge of ADABAS/Natural, data base design principles and technical support needs of an end-user distributed computing environment.

Send application and references to:

Barbara Friedman
Computing Center
**University of Maine**
Orono, Maine 04469

Review of applications will begin 11/9/87.

The University of Maine is an Equal Opportunity/Affirmative Action Employer

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### SOFTWARE ENGINEERING ANALYST/INSTALLER

Job Description:
Design, develop and install test software written in Fortran 77 to run on HP 1000 Computers and Software written in C to run on UNIX systems.
Design, develop and implement software for graphics sub-systems and Expert systems written in LISP.
Design, develop and install software in Pascal on Z80 and 8086 based data acquisition subsystems, running under INTEL & MS-DOS Systems.
Install systems around the world with current emphasis in Asia and the Middle East.
Train native operators and maintenance personnel on techniques of operations & maintenance of the system.

Minimum Requirements:
B.S. Computer Science including courses in micro-computer operating systems, 8088/8086 processor software development, design and development of inter-processor communications. Fortran 77 and Pascal programming languages and graphics software design and development.

Annual Salary: $32,775.

Submit Resume to:

Sara Sprengmeyer, #7-122
Minnesota Department of Jobs and Training
690 American Center Building
150 East Kellogg Boulevard
St. Paul, MN 55101

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HELP WANTED: Tech. Support Manager Mexican Operations

PLEASE SEND RESUME TO:

EMPLOYMENT SECURITY DEPARTMENT
ES DIVISION, ATT: ABC # 40663
OLYMPIA, WASHINGTON 98504

JOB DESCRIPTION: Manages subdivision of software company to provide technical support for localized U.S. designed and produced software for microcomputers and processors for Mexico. Manages technical support staff and determines procedures and policies to provide support for Mexican-marketed products. Works with software engineers to coordinate technical support of product. Communicates with distributors of company products re technical support needs. Travel to Mexico is necessary.

REQUIREMENTS: B.A. or B.S. in Business Administration. 20 course hours in computer languages/programming. Six months work experience in technical support for software products for Spanish-speaking market. Must be able to fluently speak, write and read spanish and english. Must be familiar with current colloquialisms, idioms and Jargon of Spanish as used in Mexico, especially as pertains to business usage.

Job location: 80% U.S. (Redmond, Washington), 20% Mexico.

SALARY: $32,500 per annum.

EOE

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# COMPUTER PROFESSIONALS

*Certified Grocers of Florida, Inc., one of the Southeast's most progressive food wholesalers, currently has the following professional positions available in their Data Processing Department located in* ***Ocala, Florida:***

### PROGRAMMER ANALYST

*MIS Professional with solid experience in on-line applications programming. Requisite experience includes 3-7 years programming IBM DOS/VSE environment. Must possess a thorough knowledge of COBOL DL/1 and CICS. The ideal candidate is team-oriented with self-motivation and strong analytical business skills.*

### SYSTEMS/PROGRAMMING MANAGER

*Ideal candidate must have demonstrated experience in leading system development projects in IBM mainframe environment. Major responsibilities include supervising Programmers/Analysts and coordinating applications system development. Must possess a strong business background in addition to a thorough knowledge of all phases of project scheduling, estimating and tracking. Experience with DOS/VSE, CICS and DL/1 essential.*

### COMPUTER OPERATIONS MANAGER

*Qualified individual to manage the daily 24-hour computer operations of the company's information services division. Position includes direct supervision and administration of teleprocessing and network communications, computer operations, problem/change and resource management. Candidates must have experience in computer equipment evaluation, system configuration and management of related operations personnel. Familiarity with IBM 4381 and S/36 systems and knowledge of VM/DOS/VSE, VSAM, DL/1 and systems scheduling software applications a must.*

### SENIOR SYSTEMS PROGRAMMER

*Highly motivated individual to join the technical support team in supporting a 24-hour rapidly growing on-line and BATCH environment. Responsibilities include maintenance and support of DOS/VSE systems software, troubleshooting IBM 4381 hardware and managing resource usage. Skills required include: VM/SP and VTAM/NCP a must; CICS, VSE/SP and DL/1 a plus. Experience with security packages and technical support management also a plus.*

### SCANNING COORDINATOR

*Outgoing individual required to support retail members' point of sale scanning systems. Duties include evaluation and configuration of POS systems, training store personnel and overseeing day to day operations of host supported scan systems. Familiarity with NSC, DTS and NCR systems essential. A working knowledge of personal computers and related retail store application software desired.*

*Excellent starting salary complemented by a fine benefits system, including profit sharing. For immediate consideration, send resume and salary history to:*

**CERTIFIED GROCERS of Florida Inc.**

***David Dillman***
*Manager Human Resources*
*P.O. Box 1510 • Ocala, FL 32678*

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Research Associate Position, Cartographer/Programmer, 40 hrs/week, 8:00-5:00, $1,909/mo., Masters Degree in Geography. Job duties: Maintain and develop software for computer mapping and digital image processing research in spatial analysis. Organize, maintain, integrate and manipulate data with from different sources and develop data storage update and retrieval procedures. Will also assist in developing software materials for international training institute activities, focusing on developing Asian countries.

Previous employment must include one year experience applying spatial geographic methodologies on both micro computers and an IBM mainframe using MVS and Statistical Analysis System software packages.

Employment requires experience in both microcomputer and mainframe using MVS and SAS.

Closing date a 30 days from publication of this issue. Send resume to: Illinois Department of Employment Security, 401 S. State St., 3 South, Chicago IL 60605, Attention: Joan Haight, Reference # 020 167-022.

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### PROGRAMMERS/ANALYSTS/CONSULTANTS

IG Systems Inc. has a number of requirements for experienced data processing professionals capable of assuming responsibility at various levels for major development projects. Openings are in CA, TX, Boston and for projects in other cities nationwide. These openings are for full-time employees with full company benefits and temporary consultants. If you have an excellent performance record and are looking for a challenge send your resume or call immediately.

Besides the basic IBM/COBOL skills, experience in the following would be a plus:

- DEC/VAX, ORACLE or COBOL
- DB2/SQL
- ADABAS/NATURAL
- CICS or IMS
- IDMS or M204
- DATACOM/IDEAL

IG Systems Headquarters
3346 Wilshire Blvd.
Suite 501
Los Angeles, CA 90010
(213) 388-0400

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Computer Applications Engineer - design, develop, implement and test commercial and network applications using INGRES, UNIX, VAX 11/780, IBM 3033, OS/MVS/JCL; maintain hardware, interface hardware and software, train users and field support staff. Bachelor's degree in Computer Science or Electrical Engineering. 1 year experience doing above or 6 months experience as Programmer/Analyst or Engineer using above hardware/software plus MS candidate in computer science. 40 hours per week. $31,547 per year. Job site: Various locations in New Jersey. Mail resume: NJ Job Service, 277 George St., New Brunswick NJ 08901. JO #0585195. No fee charged.

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## DP CONSULTANTS

For immediate and future assignments in the New York, New Jersey & Connecticut area with 2 years plus in one or more of the following areas:

| | |
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| LIFECOMM | PCS |
| ADABAS/NATURAL | |

Send your resume to:

Rosemary Stefan
**VIP Computer Consulting**
730 Bloomfield Avenue
Suite 218
Verona, NJ 07044

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ENGINEER, DESIGN: Dev., design & troubleshoot the prgm for Winchester disk controller, implement comm protocol btw IBM PC/XT/AT I/O bus & disk controller; assist h/w eng in designing special logic for the design & disk drive characteristics; dev & design sys prgm & utility prgm for IBM PC/XT/AT. $27,000/mo. 40 hrs/wk. MS Comp Eng or EE, OR BS + 2 yrs design eng exp reqd. Knowledge of IBM PC/XT/AT use & internals, BIOS & DOS use & internals, C, PASCAL, Assembly, microprocessor-based & bit-slice microprocessor design, fault tolerance & error correcting code reqd. Job site/interview: Santa Clara, CA. Send ad & resume to Dept KB-OTC-CHY, Ste. 207, 3032 Bunker Hill Lane, Santa Clara, CA 95054. Upon hire must show immediate permission to work in US permanently. EOE

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### COMPUTER PROGRAMMER

Growing DP Center in D.C. Experienced HP3000. Develop code programs using COBOL, MPE, IMAGE/QUERY, VPLUS 3000, and KSAM. Two years experience in programming required. Degree in DP or Computer Science or equivalent experience strongly preferred. Database management experience preferred. Strong interpersonal skills required. Salary from $22,458. Closing Date: November 9, 1987. Send Standard Federal Government Form 171 to: **Supreme Court Personnel Office, Room 3, Washington, D.C. 20543. (202) 479-3404**

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### DATA BASE CAREERS

| | | |
|---|---|---|
| IDMS Project Mgr | Dallas | $60K |
| IDMS Analyst, DBA, CAS | Dallas | $40K |
| IDMS Systems Programmer | Dallas | $48K |
| IDMS DBA | Milwaukee/Vermont | $36K |
| IDMS Sr. P/A | Atlanta/Dallas/Calif. | $43K |
| IDMS P/A | Dallas/Phoenix/Calif. | $38K |
| SYSTEMS/38 P/A | San Ant./Dallas | $36K |
| IMS Systems | San Antonio | $42K |
| MVS/XA Systems | East Texas | $45K |
| CICS/VTAM Systems | Dallas | $41K |
| DB2 Analyst | Open | Open |
| UNIX, C, Assembler | Dallas | $70K |
| CICS Internals, ALC San Francisco/Dallas/N.J./Houston | | $65K |

Please call or send resume in confidence to:

Harold M. Harrison
Information Technology Search Consultant
6750 King George Drive, Suite 102
Dallas, Texas 75235
(214) 638-6888

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Computer Systems Engineer - Create data acquisition program, data processing software, Dbase III database programs & scientific numerical algorithms (signal processing & Fourier transform methods) for geophysical, seismological & earthquake engineering applications. Must know 8086/8088 assembly lang., Dbase III, Fortran, C languages. Must be able to use IBM PC. Set up & integrate tape drives, hard disks, digitizers, graphic display devices, printers & plotters. Write tech. manuals, maintain & manage office inventory, reproduction & packaging. Maintain contact w/universities & research centers in fields. Consult with U.S. & foreign clients. Master's degree in Eng. req. 6 mo. exp. req. or 1 yr exp. in computer programming, scientific research or computer consulting at Bachelor level. $3,000/mo. Job site/interview: Pasadena, CA. Send this ad & your resume to: Job #MD10421, P.O. Box 9560, Sacramento, CA 95823-0560 not later than 11/3/87.

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Systems Engineer, EDP-Analyze data-processing requirements and develop software for implementation of hospital admission, accounting, billing and financial systems. Implement company standards for systems analysis, documentation, programming testing and release. Perform systems engineering, environmental and systems performance testing, and installation and software configuration management according to structured methodologies. Prepare user manuals, training and demonstrations. Provide after sale maintenance and installation support. $30,000/yr. 40 hrs. per wk. 8:30 a.m.-5:30 p.m. Req'd Masters Degree in Electronics & Telecommunications, 1 yr exp. or 1 yr. exp as Technical Consultant (Software) and work experience with Burroughs B-20/XE 500 series micro-computers, Basic, Pascal, Fortran, Cobol, DMS II, Autocoder, BTOS, CTOS op.sys., Protocol, Report, Data Manager. Contact Jack Hatcham, Tennessee Job Service, 1295 Poplar, Memphis, TN 38104.

# THE INTERCHECKS TEAM

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INTERCHECKS INC.

With an excellent reputation for personable, dependable service, Interchecks is one of the nation's foremost manufacturers of business and personal checks. Our staff is dedicated to working together in reaching a common goal, a quality product. Dynamic growth and continued success has created openings in the following Data Processing areas.

**Systems Manager** 5-10 years project management responsibility with a strong track record of successfully implementing medium to large scale systems.

**Application Supervisor** Five years of data processing experience with a strong lead analyst background.

**Programmer Analyst** 3-5 years of data processing experience with a heavy emphasis on System 38 and RPGIII.

You'll enjoy an outstanding salary and excellent benefits including medical/dental/life insurance and paid holidays, sick days, and vacations. Our progressive environment promotes professional and personal growth. Join a team that works together by forwarding your resume with salary history to: 87-B, C. Reisher, Interchecks, Inc., P.O. Box 24307, Seattle, WA 98124. Equal Opportunity Employer.

Data Processing

# ACP-TPF

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**WE ARE:**
A profitable expanding computer automation company combining EASTERN and CONTINENTAL'S data processing talent.

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Attractive compensation and relocation packages, worldwide travel privileges, vacation after 6 months, Comprehensive Health-Dental-Vision-Life and...More INNOVATIVE programs, such as: Flexible (pre-tax) spending accounts, employee referral bonuses, and PC purchase program. We provide extensive technical and/or managerial career paths, excellent working conditions, and many challenging new design projects such as AMADEUS. Our professional management will synergize your traditional and maverick talents in building your career!

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*MIAMI, FL 33178*
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## MAINE - N.H.

We have specialized in data processing professional placement in Maine & N.H. for a fifth of a century. If you qualify for positions in the $25-50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

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# WHY CHOOSE UNITED AIRLINES?

Because when it comes to sophisticated needs and systems technologies it's hard to beat us in or out of the airline industry. What it means is big-time projects, big-time technology, and big-time opportunity. Look at our environment.

We hold a position as one of the nation's 10 largest in information systems installations and one of the world's largest private networks. We have an integrated digital backbone network for voice, data, and image telecommunications applications where all data will be implemented as an SNA logical network with voice applications sharing the same transmission resources. At our Denver Apollo Center, multiple CPUs contain nearly 20 million fares supporting over 60,000 terminal devices and over 8,000 travel agencies worldwide, with a processing capacity of 1,400 messages per second. At our Chicago Center, high volume applications development efforts are continuing to meet unique and complex business needs where we're using a variety of leading edge software products and productivity tools.

Our Chicago and Denver Data Centers are supported by leading edge, large scale environments, including IBM 90XX/30XX/43XX, 3725s, PS/2s, 3705s, Sperry 1100-93, DCP 40s, MVS/XA, TPF 2.3, NCP/VTAM, VM/CMS, MS/DOS, and OS/1100. We're using CICS, IDMS, SQL, COBOL, ASSEMBLER, FOCUS, AND "C".

**OPPORTUNITIES:**

## CHICAGO

### TECHNICAL SUPPORT
- Sperry-Exec Systems Programmers
- IBM MVS/XA Systems Programmers
- CICS Systems Programmers
- DASD Performance/MVS IO Configuration Analysts

### COMMUNICATIONS
- Network Communications Specialists
- SNA Network Design Engineers
- Transmission Engineers (Satellite/Microwave/Fiber Optic)
- SNA Network Capacity Planning/Performance Engineers
- NCP/VTAM Systems Programmers

### APPLICATIONS DEVELOPMENT
- Programmer Analysts (IBM COBOL)
- Sr. Programmer Analysts (IBM COBOL)
- "C" Programmer Analysts
- Systems Analysts (MVS background)
- FOCUS Consultants
- IDMS Data Base Analyst
- Micro Data Base Administrator (SQL)

## DENVER

### ACP/TPF APPLICATIONS & SYSTEMS
- ACP/TPF Applications Programmers
- ACP/TPF Systems Programmers
- Coverage Programmers
- ASSEMBLER Language Programmers

### COMMUNICATIONS
- Communications Design Analyst
- ACP/TPF Communications Systems Programmers
- Transmission Engineer (Satellite/Microwave/Fiber Optic)
- SNA Network Capacity Planning/Performance Engineers
- NCP/VTAM Systems Programmers
- SNA Network Design Engineers

At United, we offer attractive salaries and benefits including air fare travel privileges and relocation assistance. Send resume, indicating if any preference for Chicago or Denver, to: United Airlines, Professional Employment, EXOPX-CW10-052, P.O. Box 66100, Chicago, IL 60666. Equal Opportunity Employer. Principals Only.

UNITED AIRLINES

*The World Is Looking Up To Us.*

# Computer Security Specialist

For over 200 years, Bank of Boston's most valuable resource has been the collective skills, knowledge and creativity of our employees. Today, we depend on that resource more than ever. As one of America's largest banks, we have the strength to offer you this career opportunity. If you're determined to succeed, we'd like to put our strength to work for you.

In this key position, you will develop policies and standards to provide effective access security for all corporate information resources. These include computers, software, telecommunications, programs, data and documentation for the entire bank. In addition, you will contribute to the development and implementation of training and awareness programs, technical consultation on computer security issues, and overall corporate contingency planning and testing function. We require a BA or BS and 5 to 7 years of banking-related computer security or EDP auditing experience. You must have good security instincts, excellent written and verbal communication skills, and the ability to interact successfully with all levels of management. A background in data processing and telecommunications is highly desirable. Limited travel is also required.

We can offer you a competitive salary and an outstanding benefits package. Please send resume and salary requirements to: M. Heidi Forti, Employment, 01-11-03, Bank of Boston, P.O. Box 2016, Boston MA 02106.

Put our strength to work for you.

BANK OF BOSTON

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ENGINEERS

EG&G, Idaho, Inc., prime operating contractor for the Department of Energy's National Engineering Laboratory, has immediate openings in its Electronic Engineering Group for the following:

## Senior Engineer
### Software Engineering Design & Development

Performs independent software engineering design and development tasks using established ideas and design techniques. Requires some background in formal software design methodologies, UNIX and VMS operating system, FORTRAN, and C programming languages. Prefer experience with SUN work station.

## Senior Engineer
### Hardware Engineering Design & Development

Performs independent computer hardware engineering design and engineering tasks using established ideas and design techniques. Requires background or experience configuring and integrating computer hardware and data communications equipment.

## Engineering Specialist
### Program Development & Software Integration

Provides highly advanced engineering knowledge and technique to aid in the development of new or substantially improved computer systems. Perform as principal investigator or software team leader overseeing program development and software integration. Requires experience in formal analysis and design methodologies, familiarity with data base design, SQL, 4th generation languages, knowledge of UNIX and VMS operating system, and C programming language.

## Engineering Specialist
### Hardware Definition & Systems Integration

Provides highly advanced engineering knowledge and technique to aid in the development of new or substantially improved computer systems. Perform as principal investigator or hardware team leader overseeing hardware definition and systems integration. Requires experience in building and installing hardware systems including computers, video, audio, and data communications. Experience working with fiber optics also desirable.

All positions will need, or have the ability to obtain, a DOE "L" or "Q" Clearance. Applicable Technical Bachelor's degree required. MS preferred.

Idaho Falls is located in the heart of the country's most scenic recreational areas. If interested and qualified please submit resume with salary history, in confidence to: **Employment Services, (TBD-25), EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, Idaho 83415.** We are an equal opportunity employer M/F/H/V. U.S. Citizenship required.

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# MIS PROFESSIONALS

USAir, an innovative and progressive airline is growing and we are seeking exceptional individuals to grow with us here at our suburban Washington, D.C. Computer Center.

Competitive salaries, an excellent benefits package with unlimited travel privileges, and state-of-the-art facilities await candidates with the background and experience to match these challenging positions:

### MVS SYSTEMS PROGRAMMER

Position requires 2-3 years solid XA systems experience with installation, maintenance, tuning and support of program products.

### IMS DATA BASE ANALYST

2-3 years proven experience in data management, database administration and quality assurance in an IMS environment required. Position requires interpreting and documenting end user information needs, utilizing userviews, data dictionary tools and procedures.

### TPF PROGRAMMER/ANALYSTS

2-3 years increasing experience in problem analysis, program specification, coding in ASSEMBLER and testing of TPF applications software supporting marketing and flight systems.

**Join our successful team of professionals by forwarding your resume to USAir Employment Services Dept. OCW, P.O. Box 15866, Arlington, Virginia 22215. EEO/M/F. PRINCIPALS ONLY.**

USAIR

**University of Nevada System**
**Executive Director of Computing Services**

The University of Nevada System, a statewide system with an enrollment in excess of 50,000 students and comprised of two universities, four community colleges and a research institution, is seeking applicants for the position of Executive Director of Computing Services. University of Nevada Systems Computing Services maintains several sites throughout the state, connected by a statewide network and provides computing support for the instructional, research, and administrative objectives of the entire University of Nevada System.

The UNSCS Executive Director whose office is in Reno, Nevada reports to the Chancellor of the University of Nevada Systems, receives policy recommendation from the UNS Computing Policy and Planning Committee, and is responsible for the administration of the University of Nevada Computing Services. Responsibilities include, but are not limited to, planning, budgeting, state-wide telecommunications, technological consultation, and coordination of campus and regional computing services. The salary will be in the range of $60-$70K annually, commensurate with experience.

Candidates Must have extensive knowledge and broad experience in instructional, research and administrative computing needs and applications, telecommunications, and information technology. Management experience must include a minimum of 5 years of significant academic and computing management, preferably in a college, university or multi-campus setting. The successful candidate will be committed to a service orientation, will have outstanding communications skills and experience in communicating effectively with academicians, administrators, and technicians, and will have demonstrated ability to plan for short and long range objectives and to coordinate diverse services. A Masters degree or equivalent is required; a Doctorate preferred.

Interested candidates should submit a letter of application, a resume, and three letters of reference by December 1, 1987. Please send applications to:

**Dr. Warren Fox, Chair**
**UNSCS Executive Director**
**Search Committee**
**University of Nevada Systems**
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[1] Levering, Moskowitz and Katz, *The 100 Best Companies To Work For In America,* © 1987 by New American Library, reprinted by arrangements with Addison-Wesley Pub. Co. Inc., Reading, MA 01867

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| †4381-22 | 3.2 | 16 to 32 |
| 4381-13 | 3.6 | 8 to 32 |
| 3083EX | 4.6 | 8 to 32 |
| 4381-3 | 4.5 | 8 to 32 |
| †4381-23 | 4.7 | 16 to 64 |

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|---|---|---|
| 3033-UP | [illegible] | 4 to 24 |
| 4381-14 | 6.0 | 16 to 32 |
| 3083BX | 6.8 | 8 to 32 |
| •3090-120E | 7.5 | 32 to 128 |
| †4381-24 | 7.8 | 16 to 64 |
| 3083JX | [illegible] | 6 to 32 |
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| 3081D | 10.8 | 16 to 32 |
| •3090-150E | 10.0 | 32 to 64 |
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| •3090-200E | 31.8 | 64 to 128 |
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| 3090-400 | 50.0 | 128 to 256 |
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• First installation 1987
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| 5840 | 6.4 | 16 to 128 |
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| 5867 | 22.0 | 24 to 128 |
| 5868 | 22.0 | 32 to 256 |
| 5870 | [illegible] | 32 to 128 |
| 5880 | [illegible] | 32 to 256 |
| •5890-190E | 22 | 64 to 256 |
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| •AS XL-100 | 80 | 128 to 512 |

The above information is intended as a guideline for computer users on relative computer systems instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware software configurations and system manufacturers continually modify computer models as design improvements to hardware and software arise.

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# BIDS & PROPOSALS

The State of Alaska is considering upgrade or replacement of its payroll system. A software search is underway to identify qualifying package software. To qualify software must be operating in a government environment utilizing ADABAS database management system. Qualified vendors should contact the Department of Administration, Division of Finance, PO Box C, MS 0204, Juneau, AK 99811 or call Keith Busch at (907) 465-2240 before November 15, 1987.

**REQUEST FOR PROPOSAL**

Expanding communications equipment on present IBM 5360 computer. Proposals must be sealed and received by December 1, 1987. For RFP information contact Pam Albrecht, Mcleod County, Data Coordinator, 830 11th St. East, Glencoe, MN 55336. Telephone: (612) 864-5551 Ext. 325.

Mcleod County retains the right to ammend the RFP and reject any or all proposals.

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**NOTICE OF REQUEST FOR PROPOSAL**

The Northeast Ohio Area-wide Coordinating Agency (NOACA), a governmental agency located in Cleveland, Ohio is soliciting proposals to supplement its data processing services. Copies of proposal documents may be obtained from NOACA 1501 Euclid Avenue, Cleveland, Ohio 44115 or by calling (216) 241-2414 Monday through Friday 9:00 AM - 4:00 PM, commencing October 8, 1987. Ask for Warren or Janet.

A pre-proposal conference is scheduled to held at NOACA at the above address at 2:00 PM, October 29, 1987.

Proposals are to be submitted to NOACA November 16, 1987 no later than 12:00 Noon.

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The Sacramento Municipal Utility District is considering replacement of its customer information/billing system. A software search is underway to identify qualifying package software. To qualify, software must be operating in a utility environment and run on an Amdahl 5880 series computer utilizing MVS.

In addition, the District will give preference to systems which utilize Cullinet's IDMS environment. Qualified vendors should respond by November 6, 1987 to Diane Demarest, Project Planning Manager, Sacramento Municipal Utility District, P.O. Box 15830, Sacramento, CA 95852-1830.

**IBM 4381-Q14**

El Paso county will receive sealed bids for purchase of below equipment until 9:30 a.m., 11/16/87. Successful bidder announced 11/23/87. Equipment available to purchaser on 1/11/88; must remove before 1/31/88. Purchaser responsible for crating plus freight out. Min. bid: $410,000. Bid bond for 5% of bid must accompany bid. Full purchase price must be deposited in trust for El Paso County ten days after bid award and paid to El Paso County on 1/11/88. 4381-Q14 dual processor; serial number 12064 (two instructions processing units Storage: 24 MB, two 64 KB high speed buffers CHANELS, 12 two byte and 10 block multiplexers) Consol, 3278-2A 4632 keyboard OTHER: 208 VOLT, 3 PHAZE, 3 wire, 60 HZ, RSF certified for IBM maintenance ADDRESS SEALED BIDS TO:

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Copies of the RFP will be available beginning October 26, 1987. Proposals must be submitted to the corporation by December 30, 1987, C.O.B. Direct inquiries to Mr. John J. Wheeler, Administrative Officer, NYSHESC, 99 Washington Ave., Albany, NY 12255 (518) 473-1200

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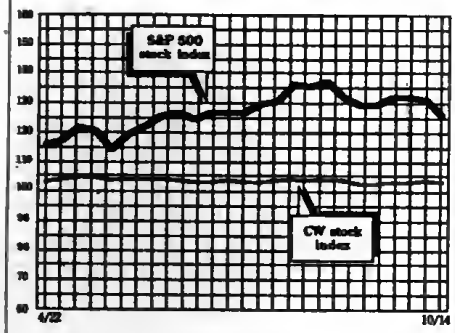


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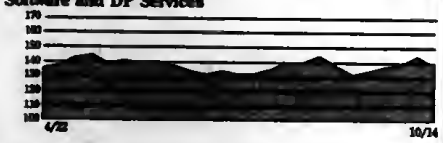
**Computer Systems**

**Software and DP Services**

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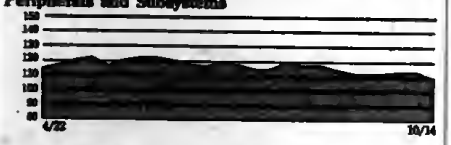
**Peripherals and Subsystems**

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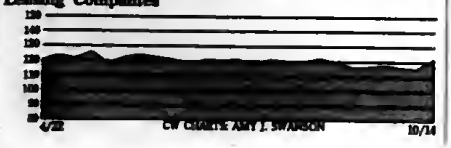


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# Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 14, 1987

| EXCH | | 52 WEEK RANGE (1) | | PRICE CLOSE OCT. 14 1987 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| | **Communications and Network Services** | | | | | |
| N | AMERICAN INFO TECHS CORP | 100 | 77 | 97.38 | +2.3 | +2.4 |
| Q | ANDREW CORP | 19 | 15 | 15.00 | -1.5 | -9.1 |
| Q | ARTEL COMM CORP | 5 | 2 | 2.50 | -0.1 | -4.9 |
| N | AT&T | 38 | 32 | 32.75 | -0.8 | -1.9 |
| Q | AVANT GARDE COMP INC | 6 | 3 | 4.50 | -0.8 | -10.0 |
| Q | AVANTEK INC | 16 | 12 | 12.63 | -1.8 | -12.2 |
| N | AYDIN CORP | 38 | 20 | 30.50 | -1.5 | -4.7 |
| N | BELL ATLANTIC CORP | 80 | 62 | 77.75 | +1.6 | +2.1 |
| N | BELLSOUTH CORP | 44 | 35 | 41.00 | +0.4 | +0.6 |
| Q | COMPRESSION LABS INC | 6 | 4 | 6.00 | +0.4 | +8.7 |
| O | COMPUTER NETWORK TECH | 6 | 3 | 3.81 | -0.4 | -9.0 |
| O | CONTEL CORP | 40 | 27 | 35.75 | -1.3 | -3.4 |
| Q | DATA SWITCH CORP | 6 | 5 | 8.25 | -0.4 | -4.9 |
| Q | DIGITAL COMM ASSOC | 49 | 21 | 28.75 | -1.5 | -3.6 |
| Q | DYNATECH CORP | 44 | 25 | 28.00 | +1.8 | +6.7 |
| Q | EQUATORIAL COMM CO | 5 | 2 | 3.25 | -0.1 | -1.6 |
| Q | GANDALF TECHNOLOGIES | 11 | 5 | 7.99 | -0.2 | -2.4 |
| Q | GENERAL DATACOMM INDS | 14 | 7 | 6.75 | -0.8 | -5.3 |
| N | GTE CORP | 49 | 34 | 42.63 | -0.6 | -1.3 |
| Q | INFOTRON SYS CORP | 12 | 7 | 9.00 | +0.4 | +4.3 |
| N | ITT CORP | 56 | 50 | 54.50 | +2.3 | +3.6 |
| N | M A/COM INC | 16 | 12 | 12.75 | -0.1 | -1.0 |
| Q | MCI COMMUNICATIONS CORP | 12 | 5 | 10.88 | +0.3 | +2.4 |
| Q | MICOM SYS INC | 16 | 10 | 11.16 | -1.8 | -13.6 |
| Q | NETWORK EQUIPMENT TECHNOLOGIES | 28 | 20 | 24.25 | -1.3 | -4.9 |
| Q | NETWORK SYS CORP | 16 | 6 | 11.50 | +0.1 | +1.1 |
| N | NORTHERN TELECOM LTD | 24 | 14 | 19.38 | -1.0 | -4.9 |
| Q | NOVELL INC | 30 | 10 | 27.00 | -0.5 | -1.8 |
| N | NYNEX CORP | 75 | 66 | 75.75 | -0.8 | -1.0 |
| N | PACIFIC TELESIS GROUP | 34 | 23 | 32.25 | +0.0 | +0.0 |
| N | PARADYNE CORP | 6 | 4 | 6.00 | +0.0 | +0.0 |
| A | PENRIL CORP | 6 | 4 | 4.00 | -0.3 | -9.6 |
| N | PLESSEY PLC | 41 | 24 | 34.00 | -0.5 | -1.4 |
| N | SCIENTIFIC ATLANTA INC | 20 | 3 | 14.50 | -1.0 | -6.4 |
| N | SOUTHWESTERN BELL CORP | 46 | 33 | 43.25 | +0.3 | +0.6 |
| Q | 3 COM CORP | 26 | 11 | 22.88 | -1.8 | -7.1 |
| N | TIMEPLEX INC | 41 | 17 | 28.38 | -2.9 | -9.3 |
| Q | UNGERMANN BASS INC | 16 | 6 | 9.13 | -0.4 | -3.9 |
| N | U S WEST INC | 60 | 45 | 58.25 | +0.5 | +0.9 |
| | **Computer Systems** | | | | | |
| Q | ALLIANT COMPUTER SYS | 37 | 6 | 3.50 | -1.0 | -8.6 |
| Q | ALPHA MICROSYSTEMS | 7 | 3 | 5.00 | +0.3 | +5.3 |
| Q | ALTOS COMPUTER SYS | 17 | 10 | 14.63 | +0.1 | +0.8 |
| A | AMDAHL CORP | 50 | 16 | 46.88 | -1.6 | -3.4 |
| Q | APOLLO COMPUTER INC | 25 | 12 | 17.63 | -3.4 | -16.1 |
| N | APPLE COMPUTER INC | 60 | 16 | 53.25 | -2.3 | -4.1 |
| N | BOLT BERANEK & NEWMAN | 30 | 19 | 21.75 | -1.3 | -5.4 |
| Q | BRITTON LEE INC | 5 | 3 | 3.50 | -0.5 | -12.5 |
| N | COMPAQ COMPUTER CORP | 75 | 15 | 70.25 | -6.1 | -8.0 |
| Q | COMPUTER AUTOMATION INC | 17 | 3 | 13.25 | -1.8 | -11.7 |
| A | COMPUTER CONSOLES INC | 12 | 4 | 4.75 | -0.3 | -11.6 |
| Q | CONCURRENT COMP CORP | 24 | 13 | 19.00 | -0.8 | -3.8 |
| N | CONTROL DATA CORP DEL | 38 | 24 | 34.75 | -0.6 | -1.8 |
| Q | CONVERGENT TECH | 12 | 4 | 5.88 | -0.6 | -9.6 |
| Q | CONVEX COMPUTER CORP | 32 | 8 | 10.00 | -4.1 | -28.2 |
| N | CRAY RESH INC | 126 | 86 | 90.75 | -2.6 | -3.1 |
| N | DASY SYS CORP | 13 | 7 | 8.50 | -0.8 | -8.1 |
| N | DATA GEN CORP | 39 | 25 | 32.88 | -2.5 | -7.1 |
| N | DATAPOINT CORP | 6 | 4 | 8.38 | +0.0 | +0.0 |
| N | DIGITAL EQUIP CORP | 200 | 92 | 183.75 | -7.3 | -3.8 |
| N | FLOATING POINT SYS INC | 17 | 3 | 5.25 | -1.1 | -12.0 |
| N | GOULD INC | 25 | 16 | 22.13 | -1.1 | -4.8 |
| N | HARRIS CORP | 43 | 28 | 38.38 | +0.0 | +0.0 |
| N | HEWLETT PACKARD CO | 74 | 37 | 65.88 | -3.9 | -5.6 |
| N | HONEYWELL INC | 81 | 58 | 77.00 | -2.8 | -3.6 |
| N | IBM | 175 | 116 | 145.25 | -7.5 | -4.3 |
| Q | INFORMATION INTL INC. | 17 | 15 | 13.25 | -0.3 | -1.6 |
| Q | IPL SYS INC | 3 | 2 | 2.88 | +0.3 | +9.5 |
| Q | MASS COMPUTER CORP | 14 | 6 | 12.16 | +0.4 | +3.2 |
| N | MATSUSHITA ELEC INDL LTD | 196 | 93 | 188.75 | -2.3 | -1.3 |
| Q | MEGADATA CORP | 7 | 2 | 4.63 | -0.8 | -8.1 |
| Q | MENTOR GRAPHICS CORP | 26 | 14 | 34.13 | -1.1 | -3.2 |
| N | NBI INC | 14 | 3 | 8.38 | -2.5 | -24.7 |
| N | NCR CORP | 87 | 42 | 76.50 | -6.1 | -7.4 |
| N | PRIME COMPUTER INC | 31 | 16 | 32.38 | -3.1 | -12.2 |
| Q | PYRAMID TECHNOLOGY | 12 | 4 | 10.50 | -0.3 | -2.3 |
| Q | STRATUS COMPUTER | 41 | 18 | 33.00 | +0.6 | +1.8 |
| Q | SUN MICROSYSTEM INC | 48 | 14 | 41.50 | +0.6 | +1.2 |
| Q | SYMBOLICS INC | 6 | 6 | 3.00 | -0.6 | -17.3 |
| N | TANDEM COMPUTERS INC | 26 | 17 | 22.88 | -2.6 | -7.1 |
| N | TANDY CORP | 57 | 32 | 50.63 | -3.3 | -6.0 |
| N | ULTIMATE CORP | 37 | 13 | 32.13 | -1.4 | -4.1 |
| N | UNISYS CORP | 48 | 23 | 43.13 | -1.8 | -3.9 |
| A | WANG LABS INC | 16 | 11 | 18.13 | -0.4 | -2.0 |
| | **Software & DP Services** | | | | | |
| Q | ADVANCED COMP TECH | 6 | 3 | 5.63 | +0.0 | +0.0 |
| N | ADVANCED SYS INC | 35 | 13 | 33.50 | +7.5 | +28.8 |
| N | AGS COMPUTERS INC | 27 | 6 | 22.13 | -1.8 | -7.3 |
| Q | AMERICAN MGMNT SYS INC | 20 | 7 | 17.88 | -1.0 | -5.8 |
| Q | AMERICAN SOFTWARE INC | 28 | 6 | 13.50 | -0.3 | -1.8 |
| N | ANACOMP INC | 11 | 3 | 6.63 | -0.8 | -3.8 |
| Q | ANALYSTS INTL CORP | 10 | 4 | 6.16 | -0.1 | -1.4 |
| Q | ASHTON TATE | 33 | 15 | 29.75 | -1.0 | -2.3 |
| Q | ASK COMPUTER SYS INC | 17 | 10 | 13.25 | -0.8 | -5.8 |
| Q | AUTODESK INC | 34 | 11 | 29.75 | -0.3 | -0.8 |
| N | AUTO DATA PROCESSING | 95 | 34 | 44.88 | -5.6 | -10.9 |
| Q | BOOLE & BABBAGE INC | 12 | 6 | 9.75 | -0.3 | -2.5 |
| N | COMPUTER ASSOC INTL INC | 37 | 12 | 33.50 | -1.8 | -5.3 |
| Q | COMPUTER HORIZONS CORP | 15 | 10 | 12.13 | -1.3 | -9.3 |
| N | COMPUTER SCIENCES CORP | 73 | 32 | 63.25 | -5.8 | -8.7 |
| N | COMPUTER TASK GROUP INC | 13 | 12 | 14.25 | -1.3 | -8.1 |
| Q | COMSHARE INC | 28 | 11 | 23.00 | +1.0 | +4.5 |
| N | CULLINET SOFTWARE INC | 14 | 6 | 12.13 | -0.8 | -5.8 |
| Q | CYCARE SYS INC | 10 | 7 | 8.63 | -0.8 | -8.8 |
| Q | DUQUESNE SYS INC | 33 | 15 | 16.75 | -1.3 | -8.6 |
| Q | EKTA INC | 16 | 6 | 14.63 | -1.1 | -7.1 |
| N | GENERAL MTRS (CLS E) | 31 | 24 | 45.25 | -2.5 | -5.8 |
| Q | HOGAN SYS INC | 17 | 3 | 9.16 | +0.6 | +7.4 |
| Q | INFORMIX CORP | 31 | 6 | 26.75 | -1.3 | -4.9 |
| Q | INTELLICORP INC | 11 | 4 | 5.38 | -0.1 | -2.3 |
| Q | KEANE INC | 10 | 6 | 8.00 | -0.8 | -4.9 |
| Q | LOTUS DEV CORP | 26 | 14 | 38.00 | -0.8 | -2.0 |
| Q | MANAGEMENT SCI AMER | 21 | 11 | 12.88 | -0.5 | -3.7 |
| Q | MICRO PRO INTL CORP | 6 | 2 | 5.88 | -0.3 | -5.0 |
| Q | MICROSOFT CORP | 75 | 17 | 71.25 | -1.8 | -2.4 |
| Q | NATIONAL DATA CORP | 34 | 13 | 28.75 | -2.5 | -8.0 |
| Q | ON LINE SOFTWARE INTL INC | 32 | 6 | 17.63 | -1.4 | -7.2 |
| Q | ORACLE SYS CORP | 38 | 6 | 32.75 | -0.6 | -1.8 |
| N | PANSOPHIC SYS INC | 28 | 12 | 23.75 | -1.8 | -9.8 |
| Q | POLICY MGMT SYS CORP | 20 | 17 | 26.75 | -1.8 | -6.8 |
| Q | PROGRAMMING & SYS INC | 14 | 3 | 12.50 | -0.8 | -3.5 |
| Q | REYNOLDS & REYNOLDS CO | 39 | 26 | 26.00 | -3.0 | -10.3 |
| Q | SEI CORP | 18 | 6 | 19.00 | -1.3 | -7.3 |
| Q | SHARED MED SYS CORP | 53 | 23 | 25.25 | -0.6 | -2.9 |
| Q | SOFTWARE AG SYSTEMS INC | 16 | 10 | 13.00 | -0.8 | -2.8 |
| Q | SOFTWARE PUBG CORP | 17 | 6 | 10.00 | -1.0 | -8.1 |
| A | STERLING SOFTWARE INC | 16 | 3 | 9.88 | +0.8 | +8.2 |
| Q | SUNGARD DATA SYS INC | 21 | 11 | 17.75 | -0.8 | -4.1 |
| Q | SYSTEMATICS INC | 30 | 13 | 27.25 | -2.0 | -6.8 |
| N | SYSL SOFT INC | 34 | 14 | 16 | -2.8 | -12.8 |
| N | URS CORP | 23 | 16 | 17.75 | -2.0 | -10.1 |
| Q | VM SOFTWARE INC | 45 | 13 | 14.00 | -1.3 | -8.2 |
| | **Semiconductors** | | | | | |
| N | ADV MICRO DEVICES INC | 25 | 13 | 20.00 | -3.0 | -13.0 |
| N | ANALOG DEVICES INC | 24 | 14 | 17.50 | -1.5 | -7.8 |
| Q | ANALOGIC CORP | 13 | 6 | 9.16 | -1.1 | -11.0 |
| Q | CHIPS & TECHNOLOGIES | 38 | 7 | 27 | -1.8 | -5.3 |
| Q | INTEL CORP | 63 | 18 | 56.50 | -4.3 | -7.0 |
| Q | LSI LOGIC CORP | 17 | 3 | 13.13 | -1.0 | -7.1 |
| N | MOTOROLA INC | 74 | 24 | 65.88 | -4.4 | -6.2 |
| N | NATL SEMICONDUCTOR | 32 | 6 | 19.75 | -0.8 | -3.7 |
| N | TEXAS INSTRS INC | 60 | 35 | 73.50 | -2.9 | -3.8 |
| A | WESTERN DIGITAL CORP | 33 | 14 | 24.75 | -0.1 | -0.5 |
| | **Peripherals** | | | | | |
| N | AM INTL INC | 3 | 3 | 7.00 | -0.5 | -6.7 |
| Q | AST RESH INC | 23 | 11 | 16.38 | +0.6 | +4.8 |
| Q | AUTO TROL TECH CORP | 6 | 3 | 5.88 | +0.0 | +0.0 |
| Q | BANCTEC INC | 16 | 6 | 12.50 | -0.1 | -1.0 |
| Q | CIPHER DATA PRODS INC | 18 | 3 | 9.13 | -0.8 | -7.8 |
| A | COGNITRONICS CORP | 5 | 2 | 4.16 | -0.1 | -2.9 |
| N | COMPUGRAPHIC CORP | 28 | 16 | 26.75 | -0.3 | -0.6 |
| N | COMPUTERVISION CORP | 23 | 13 | 14.63 | -0.8 | -5.3 |
| A | DATAPRODUCTS CORP | 16 | 10 | 10.88 | -0.3 | -2.2 |
| A | DATARAM CORP | 3 | 7 | 7.63 | -0.1 | -1.6 |
| N | DECISION INDS CORP | 16 | 7 | 10.00 | -1.3 | -11.1 |
| N | EASTMAN KODAK CO | 109 | 55 | 98.00 | -2.3 | -2.2 |
| Q | E M C CORP MASS | 29 | 10 | 23.00 | -0.3 | -1.1 |
| Q | EMULEX CORP | 10 | 6 | 7.16 | -0.8 | -8.1 |
| Q | EVANS & SUTHERLAND | 40 | 21 | 26.25 | -0.5 | -1.8 |
| Q | ICOT CORP | 13 | 3 | 7.18 | +0.3 | +3.6 |
| Q | INTERLEAF INC | 24 | 6 | 19.00 | -2.9 | -13.6 |
| Q | IOMEGA CORP | 6 | 2 | 2.50 | -0.8 | -13.0 |
| Q | LEE DATA CORP | 10 | 4 | 4.50 | -0.8 | -7.7 |
| Q | MASSTOR SYS CORP | 3 | 6 | 3.13 | -0.4 | -12.3 |
| Q | MAXTOR CORP | 24 | 10 | 12.88 | -5.9 | -6.4 |
| Q | MICROPOLIS CORP | 44 | 17 | 33.00 | +1.1 | +3.6 |
| Q | MINISCRIBE CORP | 19 | 7 | 13.16 | -2.5 | -16.0 |
| N | MINNESOTA MNG & MFG CO | 84 | 52 | 72.50 | -8.6 | -8.7 |
| A | MSI DATA CORP | 24 | 11 | 20.00 | -2.5 | -10.1 |
| Q | PRIAM CORP | 6 | 2 | 8.00 | +0.3 | +0.0 |
| Q | PRINTRONIX INC | 13 | 10 | 11.00 | +0.4 | +3.5 |
| N | QMS INC | 27 | 12 | 23.16 | -1.8 | -7.8 |
| Q | QUANTUM CORP | 35 | 16 | 15.25 | -0.8 | -4.7 |
| Q | RAMTEX CORP | 3 | 4 | 5.63 | -0.1 | -2.2 |
| N | RECOGNITION EQUIP INC | 27 | 12 | 12.00 | -3.4 | -22.0 |
| Q | REXON INC | 14 | 6 | 7.00 | -0.8 | -6.7 |
| Q | SCAN TRON CORP | 17 | 10. | 10.50 | -1.5 | -12.5 |
| Q | SEAGATE TECHNOLOGY | 46 | 17 | 19.75 | -1.1 | -5.4 |
| N | STORAGE TECH CORP | 3 | 3 | 2.75 | -0.1 | -4.9 |
| Q | TANDON CORP | 7 | 2 | 3.75 | +0.4 | +11.1 |
| A | TEC INC | 7 | 3 | 4.94 | -0.1 | -1.2 |
| N | TEKTRONIX INC | 43 | 31 | 34.38 | -0.4 | -1.1 |
| Q | TELEVIDEO SYS INC | 3 | 2 | 2.50 | -0.1 | -4.8 |
| N | TELEX CORP | 102 | 46 | 87.00 | +8.0 | +13.6 |
| Q | WYSE TECH | 40 | 13 | 35.50 | -1.3 | -3.4 |
| N | XEROX CORP | 95 | 53 | 74.38 | -0.9 | -1.2 |
| Q | XIDEX CORP | 13 | 11 | 11.50 | -1.1 | -8.6 |
| | **Leasing Companies** | | | | | |
| Q | CAPITAL ASSOCIATES | 10 | 7 | 7 | -1.25 | -15.1 |
| N | COMDISCO INC | 37 | 19 | 31.38 | -4.1 | -11.6 |
| N | CONTINENTAL INFO SYS | 14 | 7 | 8.88 | -0.8 | -7.8 |
| Q | PHOENIX AMERN INC | 6 | 6 | 4.63 | +0.1 | +2.8 |
| Q | SELECTERM INC | 7 | 3 | 4.88 | +0.4 | +8.3 |
| N | U S LEASING INTL | 67 | 42 | 67.13 | +17.8 | +36.3 |

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# Fall to earth

## *Compaq, DEC, IBM hit hard; micro leaders sustain bruises*

Some of the industry's most high-flying stocks were pulled dramatically back to earth by last week's market collapse, but other computer stocks proved resilient.

Compaq Computer Corp. was particularly hard hit, falling 9 points in four days to close Thursday at 68⅛. Another recent investor favorite, Digital Equipment Corp., dropped 11⅛ points Wednesday and Thursday despite reporting a strong, if not spectacular, first fiscal quarter. DEC closed Thursday at 177¾, down 8½ points since Monday.

IBM also felt the impact of the two-day 152-point Dow Jones plunge. Despite its first quarterly profit increase in 18 months, IBM sank 7½ points in four days to 140¼. NCR Corp. fell 6⅛ points to 72⅝.

Sun Microsystems, Inc. was one of the few stocks to advance on both Wednesday and Thursday, gaining 4⅛ points for the week to finish at 42¾.

Prominent microcomputer stocks escaped major damage. Apple Computer, Inc. was down 2⅛ points to 52, Microsoft Corp. slid 1⅛ points to 70⅛, Lotus Development Corp. dipped 1⅛ points to 34⅛, and Ashton-Tate was off one-half of a point to 29.

CLINTON WILDER

# Esber: Dbase language not for public domain

BY ALAN J. RYAN
CW STAFF

CAMBRIDGE, Mass. — Ashton-Tate Chairman Ed Esber threw down the gauntlet last week, declaring that Dbase is proprietary technology that Ashton-Tate will protect through legal channels if necessary.

Software developers and Dbase experts contacted by *Computerworld* said they were surprised by Esber's comments, delivered at the Software Publishers Association conference here. They countered that Ashton-Tate's position flies in the face of widespread opinion that a language is not copyrightable.

"The Dbase standard belongs to Ashton-Tate, and Ashton-Tate intends to vigorously protect it," Esber said. "It's proprietary technology."

Ashton-Tate's corporate counsel, Geoff Berkin, said the language is part of a copyrighted product. "We don't have a product called Dbase language," he said. "We have Dbase III Plus, which contains a lot of elements. The Dbase language is one component of a copyrighted product."

### 'Look and feel' precedent

Berkin said other recent industry lawsuits, including Lotus Development Corp.'s "look and feel" suits against 1-2-3 clone makers, have "affected how one thinks about things like this. At this time, we have no specific plans to take legal action against any other companies," he added.

"As Lotus and other software company suits clarify the law and drive legal precedents, our position will be stronger," Esber said during the speech.

Esber's remarks were directly targeted at the Dbase Standards Committee, which had assembled to hold a panel discussion on building a standard around Dbase. "Just by collecting a group of Dbase competitors, you cannot and will not put Dbase into the public domain," Esber told them.

"We've communicated to the Standards Committee our concern about the use of the word Dbase. We don't want it to appear that this is a sanctioned activity or that they have any right to put out a product they're going to call Dbase," Berkin said.

"The basic issue is that Dbase III Plus is an Ashton-Tate product, and we own the product. It would put the product on more computers if we gave it away for free, but that's not in Ashton-Tate's best interest," Berkin said. "I don't think the Standards Committee is trying to sell more copies of Ashton-Tate products."

But Standards Committee members said the purpose of setting standards is to benefit users.

David Fulton, president of Standards Committee member Fox Software, Inc. in Perrysburg, Ohio, said, "As a company, the committee doesn't do us any good at all, but creating standards is in the public interest." Fox markets a Dbase language interactive compiler.

George Juarez, chairman and chief executive officer of Nantucket Corp. in Los Angeles, agreed. "It was never our opinion that Nantucket would benefit in any way from the committee," he said.

### 'Borders on antitrust'

Esber also complained that a gathering of companies that compete against Ashton-Tate "borders on antitrust." One of the principles of antitrust, according to Berkin, "is that competitors are not supposed to sit around and talk about how they'll compete with some other party. There are members of [the Standards Committee] that are competitors of each other and of Ashton-Tate."

But committee members scoffed at the antitrust allusion.

Nantucket's Juarez, a California-licensed attorney who stopped practicing law in February to run Nantucket, said, "I'm not aware of any law in the U.S. which makes it unlawful, from an antitrust standpoint, for any group of people to get together and agree that a certain set of standards would be optimal."

### Apples and oranges?

"We're not a competitor against Dbase," Fox's Fulton said. "I don't know of a single instance of somebody buying our product who didn't have Dbase. We are serving an after-market, just like people who sell parts for automobiles. We sell additional functionality."

Martin Rinehart, chairman of New York-based Wallsoft Systems, Inc. and also chairman of the Standards Committee, said, "One interpretation I've heard [of Esber's remarks] is that they're losing market share to the compatibles, and by threatening the legality, he hopes to dampen compatible sales."

"This is a short-sighted concern for Ashton-Tate," Rinehart continued. "Promoting their language as a standard for data processing on microcomputers — and soon on minicomputers — has got to be in their best interest. Turning it into a proprietary tool will certainly encourage the use of other languages."

# Bells hunger for service pie

BY PATRICIA KEEFE
CW STAFF

SAN FRANCISCO — Pacific Telesis Group (Pactel) last week filed a proposal in U.S. District Court in Washington, D.C., that, if approved, would enable the regional Bell holding companies to offer consumers access to audiotex and videotex services and a variety of information data bases.

The filing came in response to a Sept. 10 ruling by U.S. District Judge Harold H. Greene that lifts certain restrictions on information services that were imposed on the holding companies under the 1984 consent decree.

However, Pactel spokeswoman Ginny Juhnke said that in his ruling, Greene "very loosely" defined information services and the areas that he would consider as "transmission-related" vs. "content-related" services.

The holding companies and other groups had until Oct. 15 to file their proposed definitions of information services with Greene.

Besides Pactel, about 25 other groups filed proposals, including U.S. West, Ameritech, Bellsouth Corp., Southwestern Bell Corp., Nynex Corp., ADAPSO, MCI Communications Corp., U.S. Sprint Communications Co., Dun & Bradstreet Corp., GE Information Services, the Information Industry Association, Compuserve, Inc., the Videotex Industry Association and Tymnet, McDonnell Douglas Network Systems Co.

### The Pactel dictionary

Pactel defined transmission-type services to include "transforming, processing, guiding, storing or retrieving information in connection with the transmission of information, provided such activities do not substantially alter the content of the information as sent and received." This could include electronic data interchange and electronic mail services.

The company is also proposing services that would provide introductory information content services and billing and collection services for information service providers. Electronic delivery of "white pages" that might include a listing of general product and business categories, service or product providers and their telephone numbers and addresses is another Pactel proposal.

Pactel's definition allows for changes in the form of transmitted messages but does not allow for substantial changes to the content of messages.

# It's Basic

FROM PAGE 1

of applications. Basic could also serve as an applications development language for data bases.

Microsoft may be met with resistance by users familiar with its MS-DOS batch language and by Ashton-Tate Dbase programmers, many of whom earn their livelihoods developing Dbase applications.

### Waging war

The biggest battle may be to win over 1-2-3 users who have been trained in Lotus's macro language. Lotus is battling to move its users to Lotus Extended Applications Facility (LEAF), a new Lotus macro language for future versions of 1-2-3.

In addition to positioning Basic against LEAF, Microsoft's strategy is also aimed at blunting the inroads Borland International has made into Microsoft language territory.

"One aspect of this is that [the strategy] is Microsoft's answer to LEAF but an answer to Borland as well," said Rob Dickerson, Microsoft product market manager for the languages group.

### Have a macro

One Lotus official took exception to Microsoft's Basic strategy. "Most of our customers, if given the choice, would like a variant of the C language," said Lotus spokesman Greg Jarboe, who explained that LEAF is similar to C. "If macros are so unnecessary, why put a macro translator in Excel?"

Microsoft may also position Basic as a data base development. "Most applications these days have a programming language. There is no reason to go off and invent hundreds of new crazy programming languages," Ballmer said.

"You can envision perhaps a data base product that used Basic as its language as opposed to the Dbase language or the PAL language [used in Paradox]. Why not use Basic? It is still by far the most popular programming language on PCs," he added.

Dickerson admitted that there are some shortcomings with the Basic macro strategy.

"Embedded macro languages are like the interface itself. If you can use the application, you can use the macros. Basic is a little more distant," he said.

The advantage, however, is that if users are developing macros to tie together disparate applications, they have to know each macro language, Dickerson added.

Despite some people's reservations, Microsoft is clearly committed to Basic. "Basic will never die. Basic races to the forefront again," Ballmer said.

# Microsoft takes another stab at Basic

Quickbasic 4.0, the $99 product from Microsoft Corp. that combines a compiler, an interpreter and a debugger, may be the company's first step toward a brighter future for the industry's first microcomputer programming language.

The product, which can incorporate program changes at a rate of 150,000 line/min, adds record support, multiple modules in memory and enhanced debugging capabilities.

According to Rob Relf, a Seattle-based Quickbasic beta tester, the product includes improved on-line Help and better performance. "The program is pretty much recompiled as you edit it," he said.

Much of this performance comes from Microsoft's threaded P-code technology. With threaded P-code, a program is compiled in a form that is "90% along the way to real native machine code," according to Microsoft.

The threaded P-code, however, retains enough information to allow it to be listed on-screen in source code form. As a result, the program can be easily modified without recompiling.

Quickbasic includes Codeview, a Microsoft debugger, support for mixed languages, instant syntax checking and instant command testing.

"It adds essentially all the things that people associate with modern languages, such as separate modules, and adds, for the first time, record structures, which are key for doing business applications," said Steve Ballmer, vice-president of systems software at Microsoft.

DOUGLAS BARNEY

# Pick slides system into PS/2 game plan

*Version to work as primary operating system or guest system under OS/2*

BY ED SCANNELL
CW STAFF

IRVINE, Calif. — Pick Systems is slated to announce at Comdex/Fall '87 next month a version of its Pick operating system that works with IBM's Personal System/2 series.

The Pick system will reportedly operate as a guest system under OS/2, which is being jointly developed by IBM and Microsoft Corp.

It can also function as the PS/2's primary operating system, according to company officials.

"I think the advantage for us on the PS/2 is that users can start to get some real large computer capabilities on those low-end boxes," said Dick Pick, the company's founder and president and developer of the Pick operating system.

The new Pick system has a distinct advantage over OS/2 in corporate accounts, Pick claimed, because OS/2 is primarily aimed at making single users more productive rather than at increasing a department's or company's productivity. On the other hand, the Pick operating system encourages interdepartmental productivity.

### Automating organization

"OS/2, which is the state of the art on the PC side, is still directed at automating the individual," Pick said.

"Our approach is toward automating the whole organization, and for that, you need a multiuser data management system. And that is not what OS/2 can do," he added.

Pick said he plans to license the new system. He said he has been approached by several top microcomputer suppliers who are interested in selling Pick with their products. Pick would not specify which companies had approached him.

A three-user version of the Pick system for the PS/2 Model 60 costs $795; a 10-user version costs $1,295.

The Pick system that supports three users on the PS/2 Model 80 costs $895; a 10-user version costs $1,495, according to the company.

# Encryption

FROM PAGE 1

in 1977 and is in the public domain.

In March, the NBS opened a regulatory proceeding to review the status of DES as a standard for unclassified federal information systems and sought public comments on whether to reaffirm, withdraw or limit the standard.

Because of the overwhelming support for DES shown in the public comments and the fact that there is no evidence that the DES algorithm has been compromised, NBS recently recommended that it be retained as a federal standard for another five years, according to NBS sources.

Final approval by the bureau's parent agency, the U.S. Department of Commerce, is expected in a month or two.

"The NSA has expressed concern that the amount of information being protected by DES could motivate a hostile intelligence organization to mount a large-scale [code-breaking] effort against DES," said a statement filed by Gerald R. Young, the NSA's deputy director for plans and policy.

Therefore, Young called for a compromise that would limit DES to financial transactions and support NSA's algorithms for other applications [CW, March 23]. But the intelligence agency was the only commenter that backed away from DES.

> "THE DES market may disappear if government agencies are forced to stop buying DES products."
>
> AT&T

### Supporters

Support for DES was registered by the financial community, including the American Bankers Association, the Federal Reserve System and the U.S. Department of the Treasury; numerous federal agencies; and equipment vendors such as IBM, AT&T, NCR Corp., Digital Equipment Corp., Paradyne Corp. and Honeywell Bull, Inc.

"Because government agencies are big customers of DES products, the DES market may disappear if government agencies are forced to stop buying DES products," AT&T said in its filing.

### Finally affordable

DES-based products have just recently come down to the price level at which corporate managers are willing to invest in encryption for information security, commenters said.

They warned against any government action that would discourage this trend.

One advantage of the federal endorsement is that the NBS runs a program for validating products that meet the standard.

"This is an invaluable service to commercial corporations that possess little expertise in cryptography," said a statement from Bank of America National Trust & Savings Association in San Francisco.

Several parties called for a two-track approach of providing support for DES until the alternative algorithms are readily available in low-cost products for all types of customer use.

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## INSIDE LINES

**De-wooing Dae Woo?** Leading Edge is about to drop its Taiwan-based manufacturer Dae Woo and either select another Taiwanese firm or start manufacturing its own systems, dealers said last week. Word has it that Acer Technologies has the inside track in the competition. Acer has scheduled a press conference at next month's Comdex/Fall '87 to announce a "major agreement with an American compatible maker," according to the firm's public relations people, although they declined to provide details. Acer is one of the top three or four computer manufacturers in Taiwan.

**Secret courtship.** Wang and ITT explored merger possibilities in 1985, according to a forthcoming book by ITT Chairman Rand V. Araskog. Wang confirmed last week that Araskog met with Wang Chairman An Wang at that time, when ITT was fending off hostile takeover attempts. Araskog's book, *Tumultuous Years: A Personal Account of the Rebuilding of ITT*, will also relate a potential ITT-Burroughs merger discussion between Araskog and now Unisys Chairman W. Michael Blumenthal.

**In transit.** IBM's 9370 Models 40 and 90 began shipping Oct. 2 without the fanfare that has lately become customary for the company. IBM had promised the two models would hit the streets in October.

**Packing the tool kit.** Apollo is scheduled tomorrow to introduce the first product based on its Network Computing System (NCS), a concept that will allow pieces of applications to be simultaneously processed on different resources in a heterogeneous network. The NCS product is reportedly a tool to help manage applications that are spread across a network. Also, the vendor plans to announce that NCS will be available for additional operating environments. It already supports the Apollo platform and other Unix-based systems as well as DEC's VMS systems.

**Storm clouds up high.** War may be brewing between neighbors Quadram and Digital Communications Associates (DCA). Today, Quadram is expected to jointly announce with Chips and Technologies that it will build low-cost IBM 3270 emulation boards to compete directly with DCA's Irma boards. Meanwhile, DCA is hosting an elaborate press junket the same day in the town of Remote (get it?), Ore., population 15. The plot is to whisk reporters in Lear jets from San Francisco and San Jose, Calif., to Oregon, where DCA will unveil remote (get it now?) micro-to-mainframe communications products in the town's general store.

**Reality check.** Zenith Data Systems has boldly promised to ship OS/2 by the end of the year. But Steve Ballmer, vice-president of systems software for Microsoft, doesn't think they'll make it. "I don't think it will ship this year," Ballmer said. Microsoft is apparently on schedule to ship the next-generation microcomputer operating system to its hardware OEMs within a month, but it will take some time for the hardware vendors to add device drivers and take care of final hardware modifications.

**Watching the ticker.** As of press time Friday, Telex had not responded to the Oct. 8 tender offer of $65 per share launched by arbitrageur Asher Edelman. Analysts have speculated that Edelman might increase the offer, but he would probably wait until after a Telex response before doing that. Telex stock, which rose sharply Oct. 9 to 70⅝, eased back to 67⅝ at the close of trading Thursday.

**Rodney Dangerfield Enterprises.** In the midst of the dust storm being kicked up by IBM and DEC in their battle for the mid-range, some other companies just aren't getting any respect. When word came out that Wang planned a product introduction for today, a preannouncement poll of a dozen consultants and analysts who normally follow Wang typically brought this kind of response: "I've been so busy with IBM and DEC that I haven't talked to Wang in months." Those observers who did speculate listed PC connectivity tools, low-end systems in the DEC VS 5 and VS 6 class and the promised high-end VS 7320 as the products most likely to debut.

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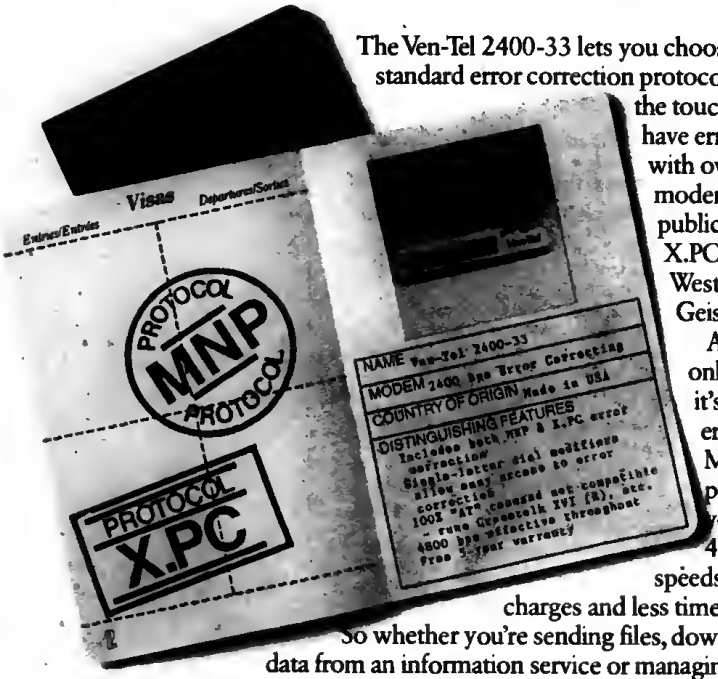


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